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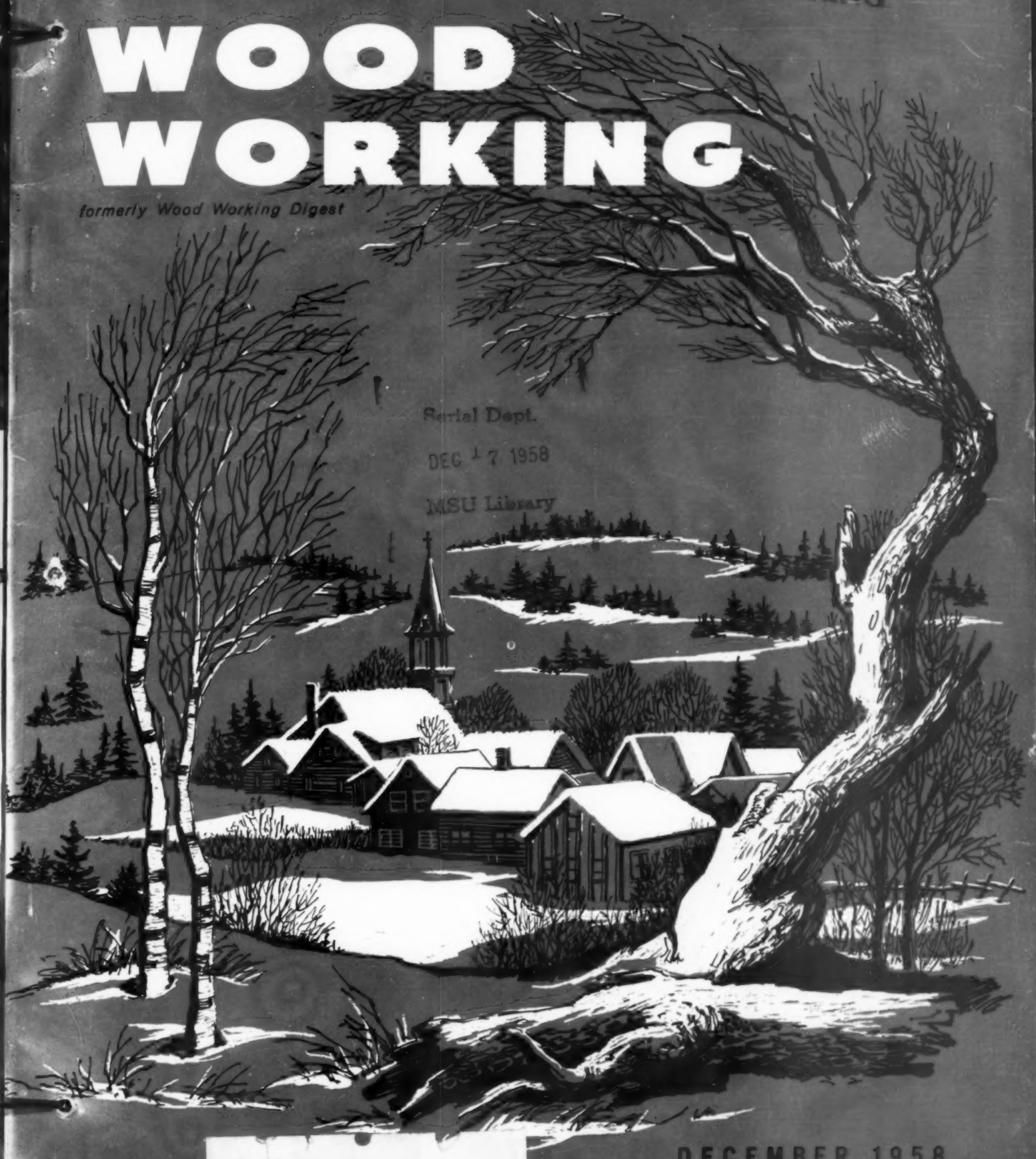
formerly Wood Working Digest



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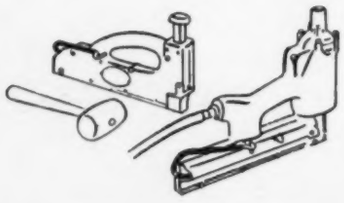
Now Nail and Pin by Pushbutton

the Faster SPOTNAILS Way!

You can set up a smooth-flowing production line anywhere in your plant with a portable Spotnailer. Drive a heavy-duty fastener ⅜" to 2" long as fast as an inexperienced man can touch the button. No bent nails or pins to back-up the production line. No drilling needed even in hardwoods. Fasteners can be countersunk automatically to a pre-set depth as they are driven. Splitting, denting and gouging of costly wood surfaces is prevented. On many jobs you can triple production by nailing and pinning the faster pushbutton way.

To learn how pushbutton-Spotnailers can increase your profits WRITE FOR a descriptive folder and demonstration.

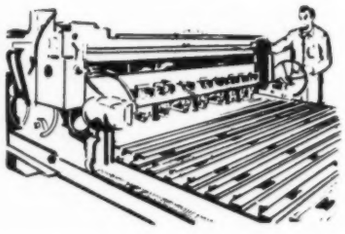


SPOTNAILS, INC.
EVANSTON 1, ILLINOIS

Labor Saving In Desk Manufacturing

Invisible Nailing of Boat deck

Use of Multiple Spotnailers on Millwork

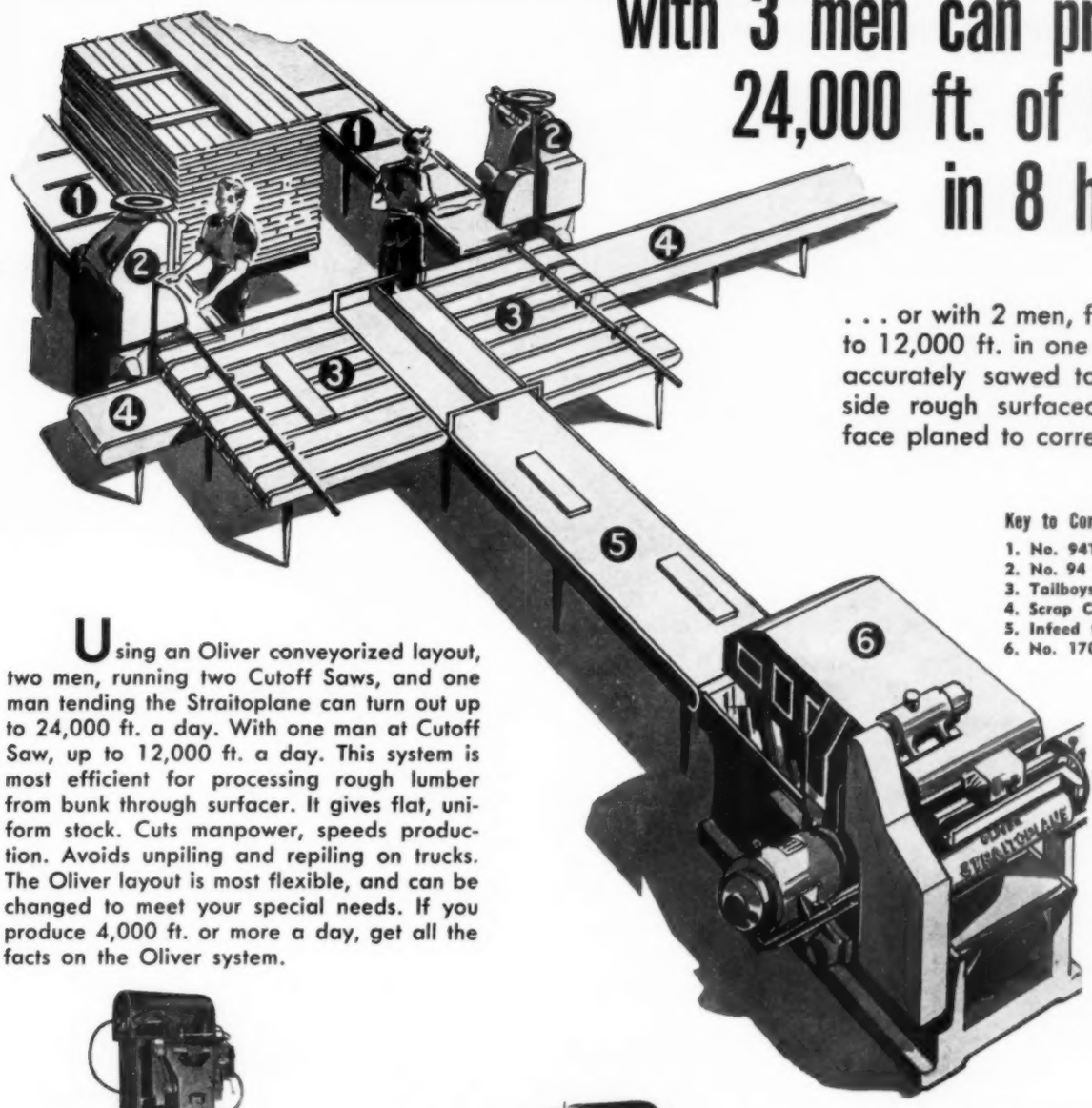


Millwork . . . all jobs

Corner Block Nailing Pinning Chair Rungs and other hardwood dowels

Butting pieces with new wide staples

OLIVER CONVEYORIZED ROUGH MILL with 3 men can process 24,000 ft. of lumber in 8 hours



. . . or with 2 men, from 6,000 ft. to 12,000 ft. in one day. Stock is accurately sawed to length, one side rough surfaced, other side face planed to correct dimension.

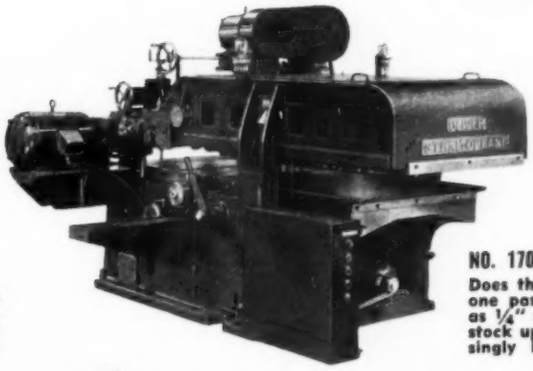
Key to Conveyorized Layout—

1. No. 94T Infeed Table
2. No. 94 Cutoff Saw
3. Tailboys
4. Scrap Conveyor
5. Infeed to Straitoplane
6. No. 170 Straitoplane

Using an Oliver conveyorized layout, two men, running two Cutoff Saws, and one man tending the Straitoplane can turn out up to 24,000 ft. a day. With one man at Cutoff Saw, up to 12,000 ft. a day. This system is most efficient for processing rough lumber from bunk through surfacer. It gives flat, uniform stock. Cuts manpower, speeds production. Avoids unpiling and repiling on trucks. The Oliver layout is most flexible, and can be changed to meet your special needs. If you produce 4,000 ft. or more a day, get all the facts on the Oliver system.

OLIVER NO. 94-DH CUTOFF SAW

This hydraulic Saw cuts fast and smooth. Has extra large capacity. Cuts thousands of pieces without variation of .005 inch. Built for years of top service.



NO. 170 STRATOPLANE

Does the work of a single surfacer and facing planer in one pass. Takes stock out-of-wind planing out as much as ¼" on each side at speeds up to 90' a minute. Takes stock up to 36" wide, 6" thick, as short as 16" when fed singly. Planes many narrow strips at one time.

A Few Users—

Baldwin Piano Company
Brunswick-Balke-Collender Company
Stork Line Furniture Co.
Stow & Davis Furniture Co.
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An Oliver Conveyorized Rough Mill is a money-maker.

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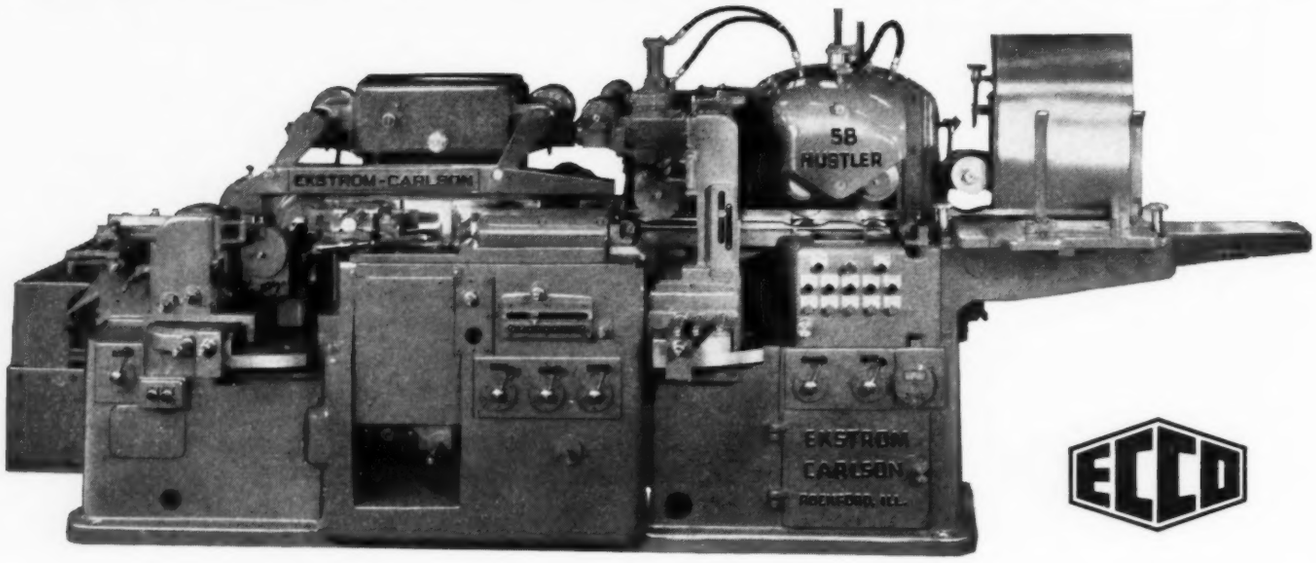

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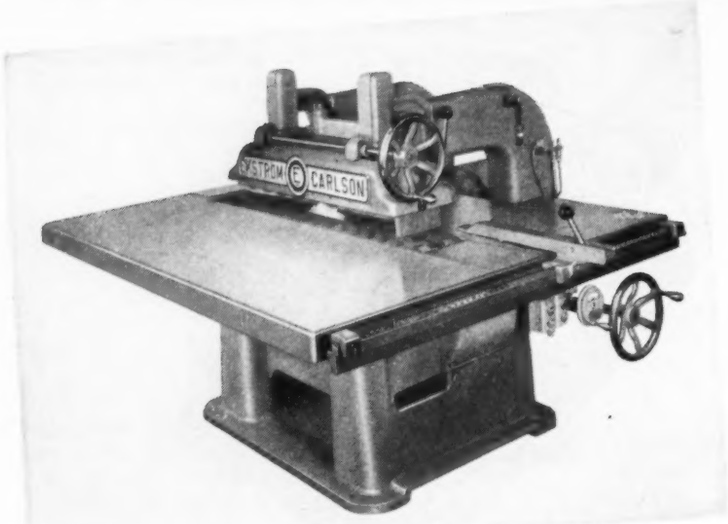

58 HUSTLER HI SPEED MOULDER

Spindle speeds 7200, 10,800 and 14,400 RPM provide an astonishing smooth finish to material. Angulating spindles provide shear cutting with straight knife heads. Has hydraulic pressure and movement controls. An entirely new concept in moulder design. **Send for Bulletin 58.**

MODEL E RIP SAW

Straight line, glue joint rip saw that features variable feed control from 56 to 225 FPM, patented throat inserts, interchangeable chains AND races and smooth vibrationless performance at fast feed speeds. **Send for Bulletin E.**

606 BEE-LINER CUT OFF SAW

A rugged, precision unit with perfect balance, light weight ram and powerful motor provides exceptionally fast and accurate cross cutting. **Send for Bulletin 606.**

THE COMPLETE ECCO LINE

No matter what your requirements are, you are sure to find a high quality Edge Belt Sanders, Pneumatic Drum Sanders, Shapers and Routers woodworking machine in the **complete** ECCO line including moulder cutterheads, router bits, form cutters and carbide-tipped cutters. Get the facts and latest information — write for complete Bulletins and specifications today. Use the coupon below.

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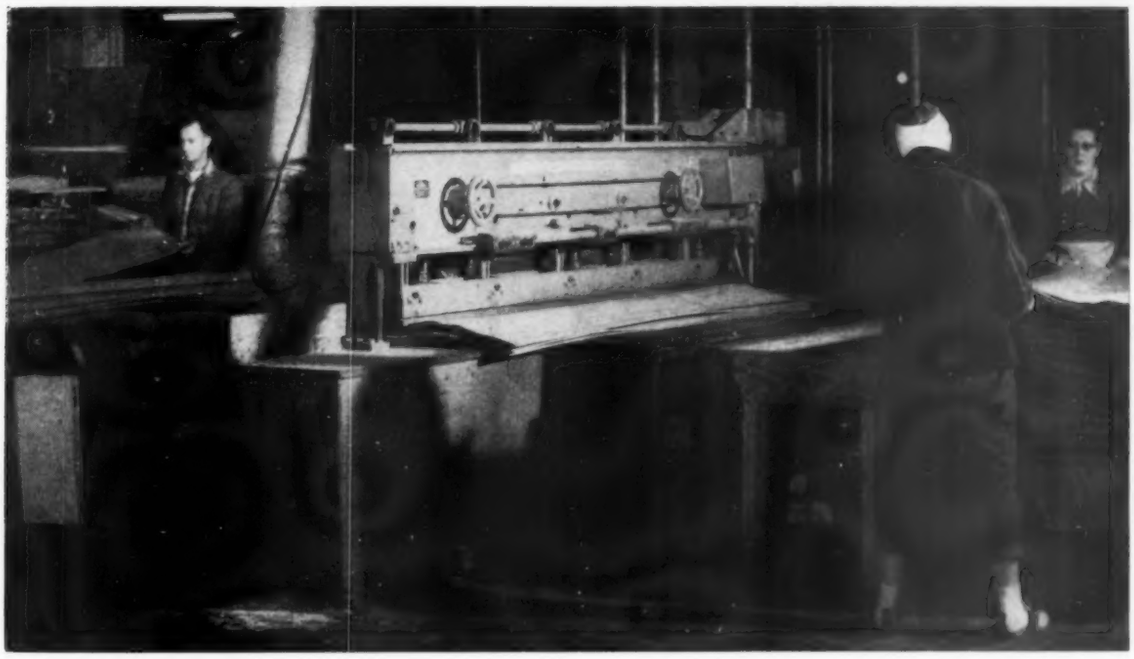
YOU GET THE ACCURATE JOINTS GOOD PLYWOOD REQUIRES WITH A

MERRITT-SOLEM VENEER JOINTER



A Merritt-Solem Veneer Jointer at work in the plant of Sooke Lake Lumber, Ltd., Victoria, British Columbia, Canada.

ACCURATE BEYOND BELIEF

Veneer Lathes

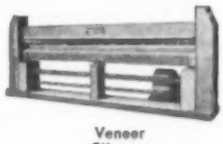
The hydraulically-operated traveling carriage is so accurate it produces joints straight within .003" in 16 feet—not just on special setting, but in everyday mill run of the work. The accuracy is built in—you can expect it regularly with a Merritt-Solem Veneer Jointer.

SOLEM'S NEW PLANT IN ROCKFORD

Solem's new modern plant in Rockford, Illinois is conceived and planned with the idea of bringing Solem Machine Company and the Merritt-Solem Division together under one roof as soon as possible, to more closely integrate and expedite the entire operation. This large modern plant will make it possible for us to pass still greater benefits along to our customers and provide them with still better service.

INFINITELY VARIABLE SPEED

Although a maximum cutting speed of 75 feet per minute is readily obtainable with a Merritt-Solem Veneer Jointer, you are not limited in any way—any speed up to the maximum is available through the hydraulically-powered system.



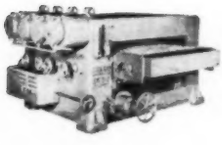
Veneer Clippers

CAPACITY MEANS PRODUCTION

The Merritt-Solem Veneer Jointer is a large-capacity machine. Made in sizes from 8 to 16 feet; taking veneers up to 198". Limit switches govern overall travel of the carriage, which can be stopped automatically at any point. Two big motors on the traveling carriage power the cutters; another motor in the base powers the hydraulic pump. Really a machine that can put out the work.

Merritt-Solem Division of Solem Machine Company makes other machines you need in veneer and plywood manufacture, too. Lathes, Clippers, Hot-Plate Presses, Double-Deck and Endless-Bed Sanders.

WRITE TODAY FOR MORE INFORMATION



Solem Endless-Bed Drum Sanders

Solem Double-Deck Drum Sanders

Hot Plate Presses

MERRITT-SOLEM DIVISION

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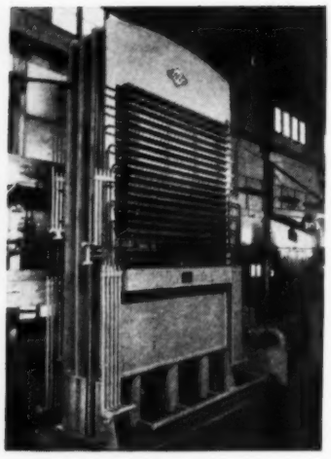
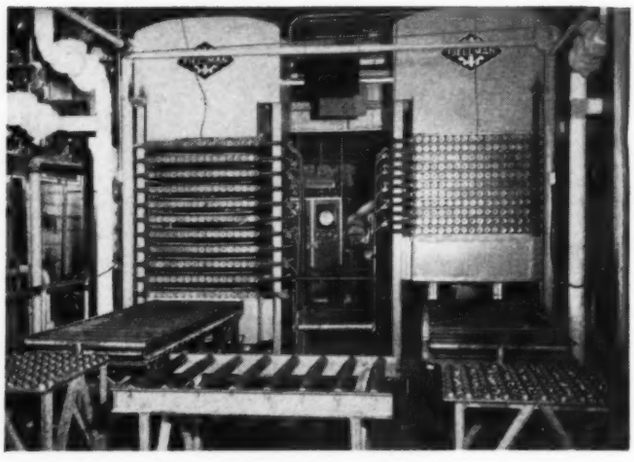
VENEER | PLASTIC | PARTICLEBOARD HARDBOARD | ALUMINUM

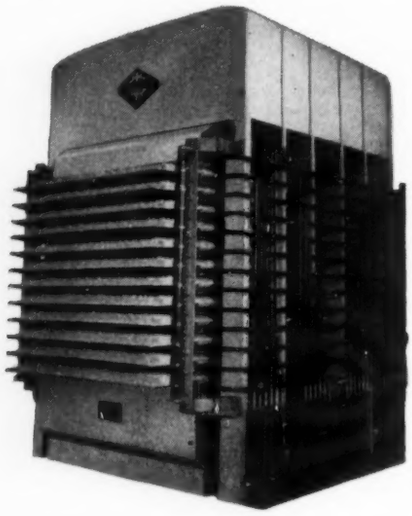
For Every Pressing Requirement — Hot or Cold



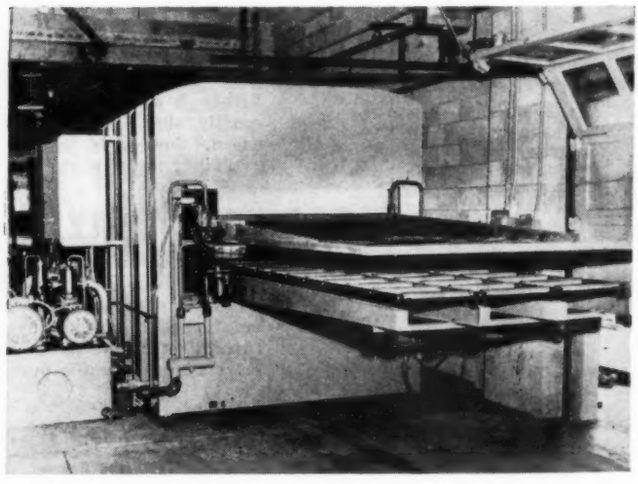
Veneer and Plywood: Presses available 1 to 24 openings in platen sizes up to 90″ x 300″, up to 350 PSI over entire platen area. Recent installations: Weyerhaeuser Timber Co., MacMillan & Bloedel, Ltd., Evans Products Co., Oregon Veneer Co.



Plastic: Presses available 1 to 24 openings in platen sizes to 66″ x 150″, up to 1600 PSI over entire platen area. Recent installations: Vinyl Plastics, Fabricon Products, Fiberesin Plastics, Albano Co. Virtue Bros. Mfg. Co., McNeff Industries.



Particle Board, Chip Board, Etc: Presses available 1 to 24 openings in platen sizes to 66″ x 150″, up to 1600 PSI over entire platen area. This Fjellman-American hot press is capable of producing the finest particle-type board by wet or dry processes, either chip, flake, shaving or fibre.



Automatic Press Loading-Un-Loading: Auto-Loading Shuttle Feeder makes short work of the loading cycle. Permits doubling present output. Raw materials and finished pieces are shuttled simultaneously to opposite ends without interruption — with minimum crews, reduced idle press time and reduced handling costs.

Minimum tolerance Laboratory presses up to 3000 PSI over entire platen area for manufacturers' research in producing all types of wood, chip and plastic lamination. Aluminum gluing presses for any production requirement.

Write for latest catalog giving application and technical data on the complete Fjellman-American line.

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DECEMBER '58

Vol. 60

No. 12

Trained inspectors examine the production line for flaws at Eberhard Faber Pencil Company. New methods at this plant include the rapid handling of materials by conveyor systems. The complete story of the operation begins on page 33.

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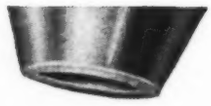
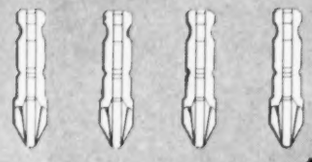
2-way saving in bit costs

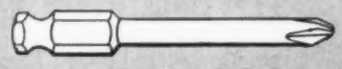


HY-PRO

You get 4 HY-PRO PHILLIPS Insert Bits



for the cost of 1



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HY-PRO PHILLIPS Insert Bits cost only about one-fourth as much as solid bits, and there is no extra expense for re-sharpening. When a HY-PRO bit wears out, you simply replace it with a new bit . . . and restore *full* driving efficiency at negligible cost.

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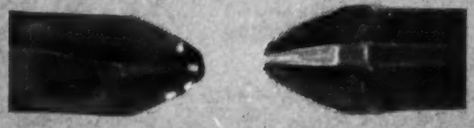

Best comparable bit — HY-PRO Phillips Bit

Each bit drove the same number of screws

High strength *forged* HY-PRO Bits are production tested and proved to have an average service life *double* that of the best comparable bits. Many users report even greater margins of extra life for HY-PRO bits, often as high as 4 to 1.

Make your own tests— Compare bit life on your toughest driving jobs. Figure *all* costs. Continental Assembly Specialists will cooperate fully in conducting tests. You'll find HY-PRO Insert Bits and Holders your best buy for lasting bit economy.

Precision control with the same Phillips master tools assures uniformly accurate fit of HY-PRO Phillips Bits and HOLTITE Phillips Screw recesses. Use this proved combination for the top efficiency you need in assembly — especially with power and automatic driving equipment — to avoid downtime, rejects, and weak fastenings. For full information, write: Continental Screw Co., Dept. WD, Mt. Pleasant St., New Bedford, Mass.

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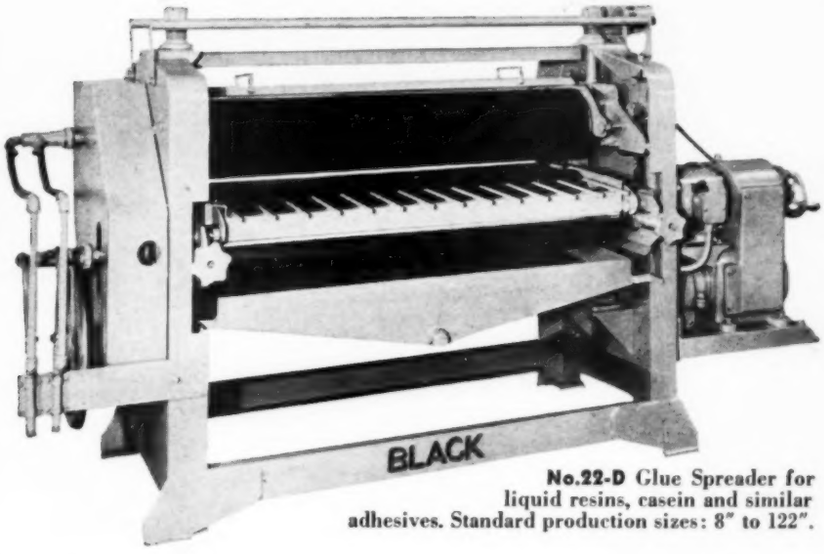
Brilliant New Successes in Gluing and Laminating



No.22-D Glue Spreader for liquid resins, casein and similar adhesives. Standard production sizes: 8" to 122".

A West Coast manufacturer speeds production of hollow core flush doors with the No. 22-D, 50".

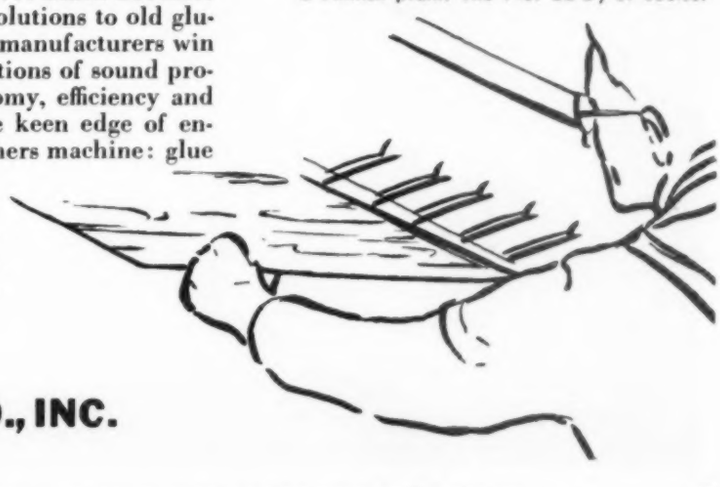
For glue testing and development work, a leading glue manufacturer depends on the No. 22-D Spreader.

Versatile No. 22-D Spreader helps produce laminated beams and roof trusses at a California mill.

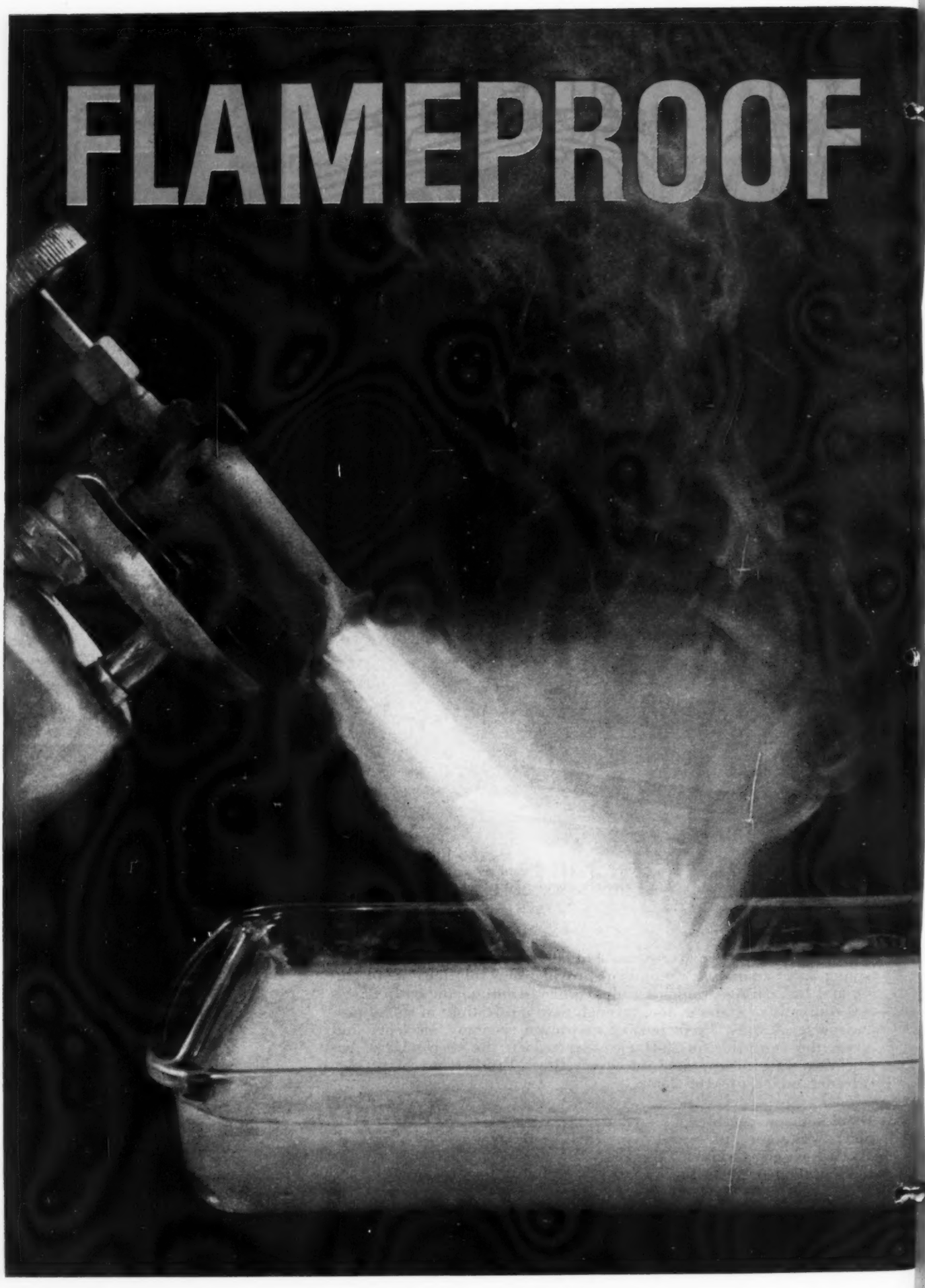
Fast, economical production of plywood in a Finnish plant. The No. 22-D, of course.

On production lines, in glue rooms and laboratories . . . Black Brothers Gluing and Laminating Equipment provides new solutions to old gluing and laminating problems. Helps cost-conscious manufacturers win new competitive markets, too, through new applications of sound production techniques. Preferred for its proven economy, efficiency and speed, the versatile No. 22-D Spreader reflects the keen edge of engineering skill incorporated into every Black Brothers machine: glue spreader, mixer, press or clamp.

Shouldn't you consider a Black Brothers installation? Write for our Supplement to Bulletin No. 11-A which gives construction details and specifications on the No. 22-D Glue Spreader.



THE BLACK BROTHERS CO., INC.
MENDOTA 6, ILLINOIS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Today! A completely safe contact cement. No flammable solvents. No flash fire hazard. No toxic vapors. A major advance in adhesive technology. Its name: WATER-THINNED INSTANT-LOK.

INSTANT BONDS—Water-thinned Instant-Lok produces strong, instant, creep-resistant bonds ideal for plastic laminating and other rapid assembly work. Bonds are highly heat and water-resistant. High strength is illustrated at right.

LOWER COST—Water-thinned Instant-Lok gives double the mileage of conventional contact cements, over 300 sq. ft. per gallon spread. Thinner glue coats bond wood, decorative plastic laminates, metals, etc., at lower overall cost.

EASY CLEANUP—Brushes, spray guns and rollers are easily cleaned with soapy water before adhesive film dries thus avoiding hazardous cleanup with flammable solvents.

FREE SAMPLE—We'll be glad to send a free sample and further information. Write telling us something of the use you have in mind.

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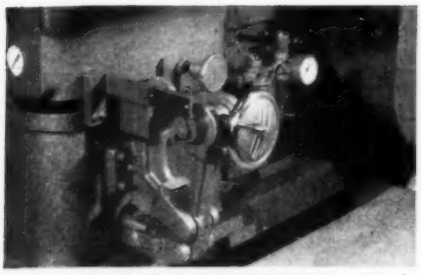
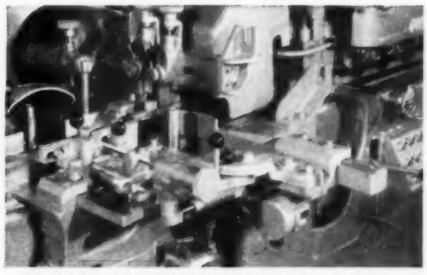
Here they are!

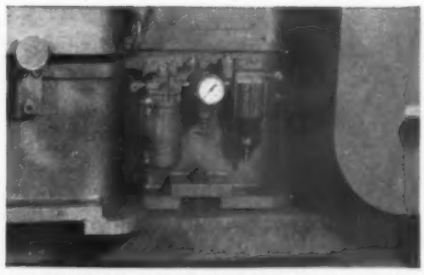
NEW Diehl 5-head moulders



FAST, ACCURATE SET-UP CHANGES — Handwheel, conveniently located at infeed end, lowers and raises bed . . . provides exact depth of cut desired on first bottom head. Locking lever assures complete rigidity of bed in any position.



IMPROVED CHIPBREAKER DESIGN — Sidehead chipbreaker features quick release for set-up and safety. Cam adjustments quickly accommodate a complete range of cutting circles and swings. Rugged construction for all types of heavy work.



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. . . designed for speed, accuracy, economy

This new line of 5-Head Moulders gives you all the profit-making features you'd expect from Diehl . . . and then some! It's built for volume production . . . provides the same trouble-free efficiency found in Diehl's famous 4-Head Moulders.

Addition of the fifth cutterhead means greater versatility . . . lets you combine several operations into one. With two bottom heads in operation, for example, the first head eliminates pre-surfacing of rough material . . . yet assures a perfectly smooth, flat surface against the bed. Result: Precision machining at lower operating cost!

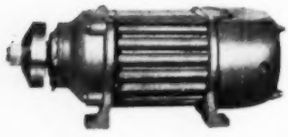
The new Diehl 5-head series is available in 6″, 8″ and 12″ sizes with two bottom heads or two top heads as desired. See the complete line of performance-proved Diehl Moulders before you buy . . . there's one that's just right for your operation. Write for bulletin or contact your exclusive Diehl representative.

Diehl

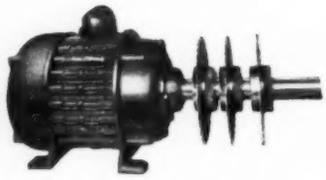
THE G. M. DIEHL MACHINE WORKS, INC.
WABASH, INDIANA

For 50 Years . . . Standard of Comparison in the Woodworking Industry

Serving the Industry Since 1852



TYPE L ARBOR 1–30 H.P.
Flatted top or side for maximum cut.



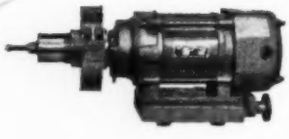
TYPE G ARBOR 1–100 H.P.
Vertical or horizontal application.

TYPE K F ARBOR 1–15 H.P.
Ventilated.

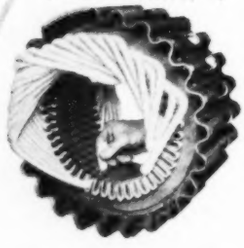
TYPE U ARBOR ½–10 H.P.
For vertical application.

WOODS
PRECISION MOTORS

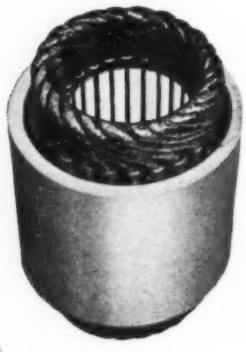
SHAFTLESS MOTORS.
Furnishing direct drive to high speed spindles at relatively low cost. Available for nearly every class of direct built in application.



TYPE U ½–10 H.P.
With precision base and cutter head mounted.



FULL TAPE INSULATION
gives extra years of service.



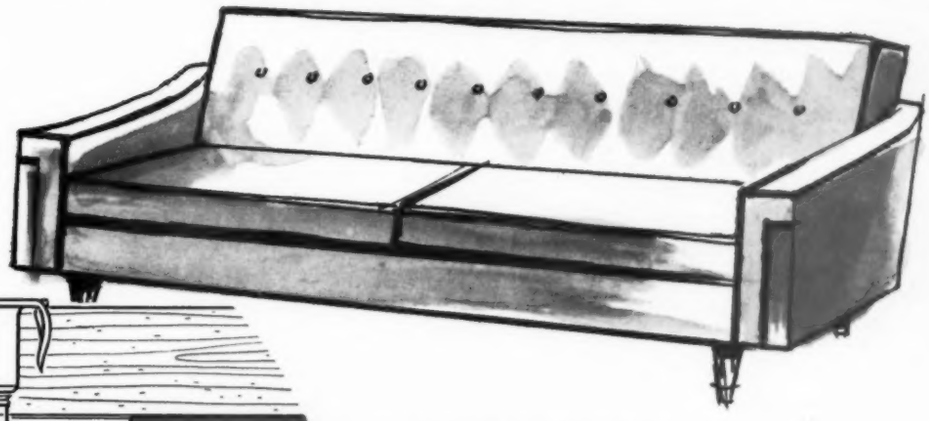
Wood's Motors, Motor Arbors and Shaftless Motors enjoy an International reputation for adaptability, flexibility and exceptionally long trouble-free years of service. A Wood's Motor means Positive Power combined with lifetime economy for your industrial requirements.

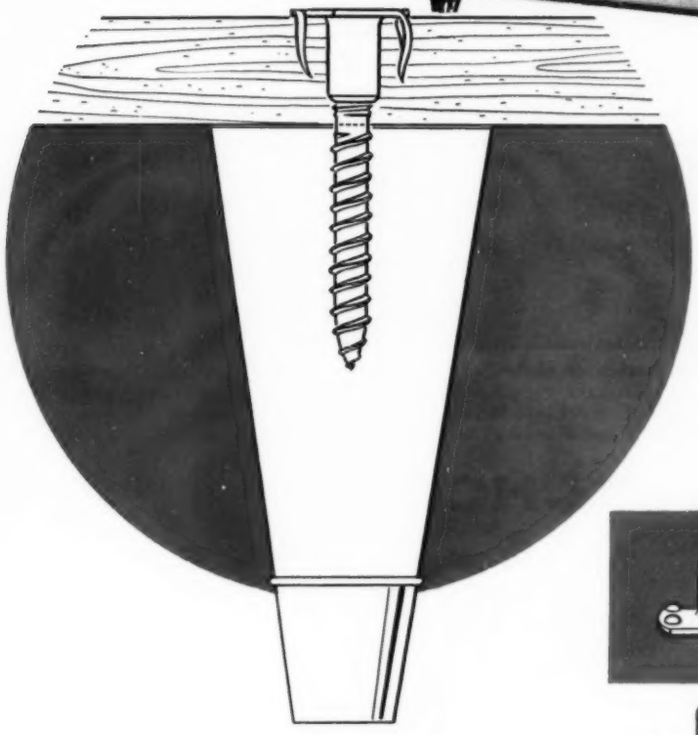
WRITE TODAY FOR DESCRIPTIVE MATERIALS.

MOTOR DIVISION

S. A. WOODS MACHINE CO.
27 DAMRELL STREET
BOSTON 27, MASS.

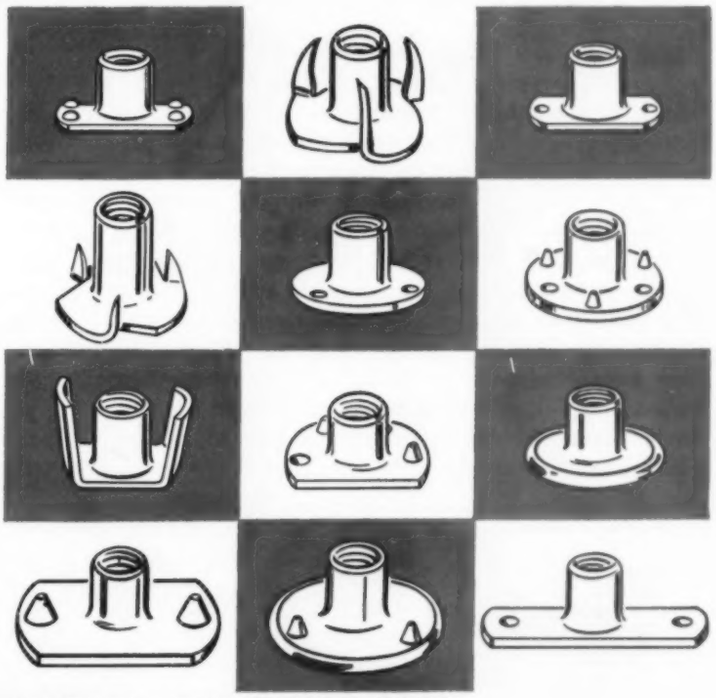
*TEENUTS®
in volume and variety





THE ORIGINAL HIGH STRENGTH BLIND FASTENER

Teenuts provide steel threads in wood and permit repeated assembly and disassembly without damage. Simply drill hole same size as Teenut barrel and hammer in the Teenut. Prongs penetrate deeply into wood and provide positive anchorage for common or hanger-type bolts screwed into barrel. Counter-boring permits completely flush mounting.



Illustrated are just a few of the more than six hundred different types of Teenuts available according to thread size, barrel length, mounting method and flange configuration. Teenuts are manufactured in volume for use with either wood or metal furniture and special types can be designed and produced to your specifications if volume warrants the cost of tooling. For further information, write for Engineering Data Catalog, Section E.

*The name TEENUTS is a registered trademark of United-Carr Fastener Corp.

CARR FASTENER COMPANY
Division of United-Carr Fastener Corp., Cambridge 42, Mass.

MAKERS OF DOT *FASTENERS*

On-the-spot examination of historical data at Greenlee Brothers and Company, Rockford, Illinois brought together (left to right) J. A. Lengquist, Manager of Greenlee's Wood Working Machinery Department; Elsiebeth McDaniel, Editor, Hitchcock's Wood Working; and Darrell Ward, Hitchcock's Field Editor.

THE MEN FROM HITCHCOCK

. . . in this case a Mister and a Miss . . . are pictured on one of their many field trips to seek out information for the forthcoming 60th Anniversary Issue of Hitchcock's Wood Working. This continuous and persistent effort on the part of Hitchcock's editorial staff will prove to be the big reason why the November Wood Working will be the outstanding issue of the year in this field. Readers will be extremely interested in the reports comparing old machinery and methods to their modern counterparts. Special editorial features like "Yesterday's Progress—Today's Reality," "Frightening New Developments Prove Beneficial," "Adhesives—Past, Present and Future" and What Makes a Wood Popular" provide assurance that this issue will be read, re-read, talked about and saved.

Hitchcock's Wood Working publication, like the products manufactured by Greenlee, a consistent and satisfied Wood Working advertiser for *over 50* years, has followed the trend of industry—always reporting up-to-the-minute trends, new markets, new machinery and new methods in a manner that has developed an outstanding readership record. This readership assures you, as an advertiser, that your sales-message will be read by the prime buyers in this industry at a time when they are editorially preconditioned to be most receptive to your new ideas, equipment and methods.

For complete information on how a specific Hitchcock publication will help to round-out your over-all advertising and marketing program talk to *your* "Man from Hitchcock" or write today for Data Files.

METALWORKING

Machine & Tool Blue Book
Machine & Tool Directory
Grinding and Finishing
Carbide Engineering

WOODWORKING

Hitchcock's Wood Working Digest
Hitchcock's Wood Working Directory

TRANSPORTATION

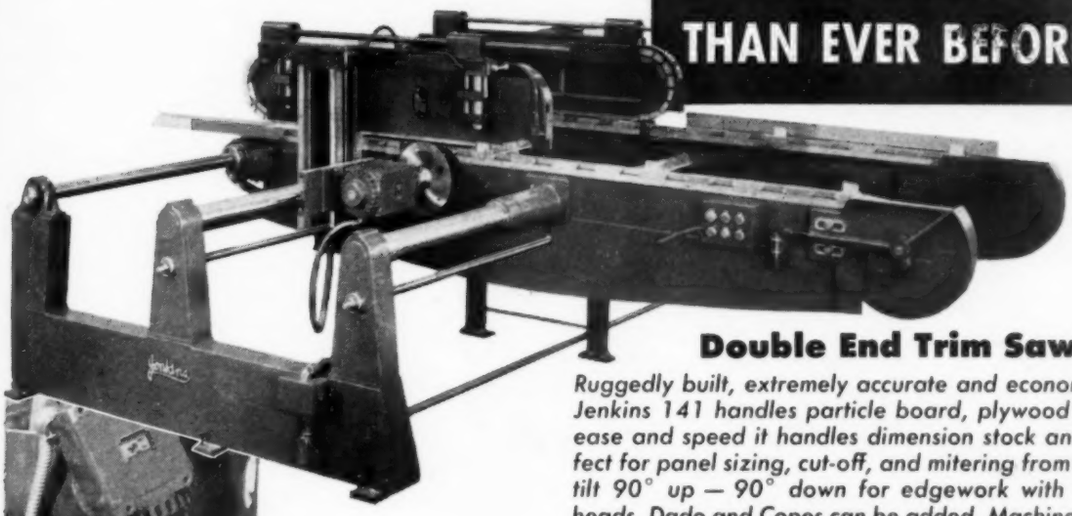
Mass Transportation
Mass Transportation's Directory
School Bus Trends

hitchcock
PUBLISHING COMPANY
WHEATON • ILLINOIS
SINCE 1898

THE PIONEER OF CONTROLLED CIRCULATION

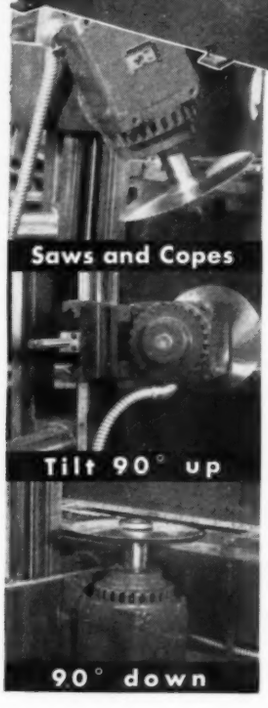
NEW JENKINS 140

MORE RUGGEDNESS.. FLEXIBILITY..and ACCURACY FOR LESS MONEY THAN EVER BEFORE!



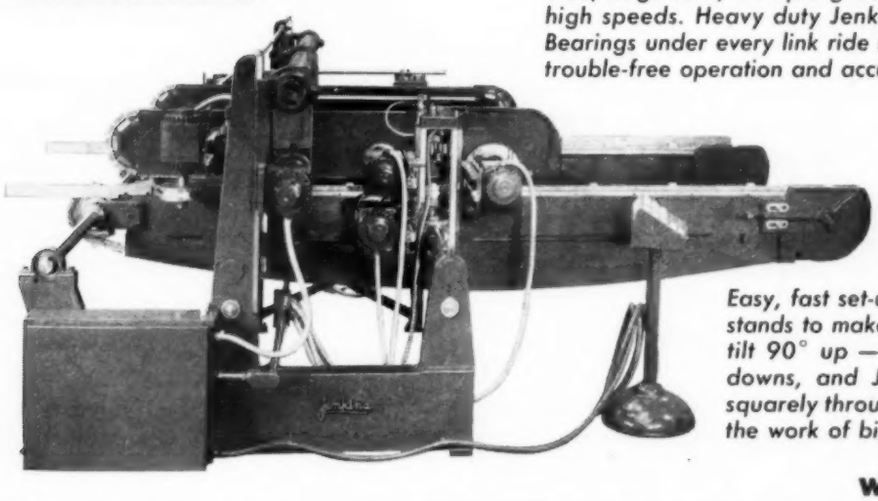
Double End Trim Saw

Ruggedly built, extremely accurate and economically priced . . . the Jenkins 141 handles particle board, plywood and doors with same ease and speed it handles dimension stock and furniture parts. Perfect for panel sizing, cut-off, and mitering from top or bottom. Arbors tilt 90° up — 90° down for edgework with Cope or Jointer-type heads. Dado and Copes can be added. Machine sizes to suit customer.



Double End Trim Saw with Dado

Size, edgework, multiple groove, and split panels in one pass at high speeds. Heavy duty Jenkins Piston-Type Chains with Insurok Bearings under every link ride in Bronze Tracks . . . means lifetime trouble-free operation and accuracy. Copes can be added.

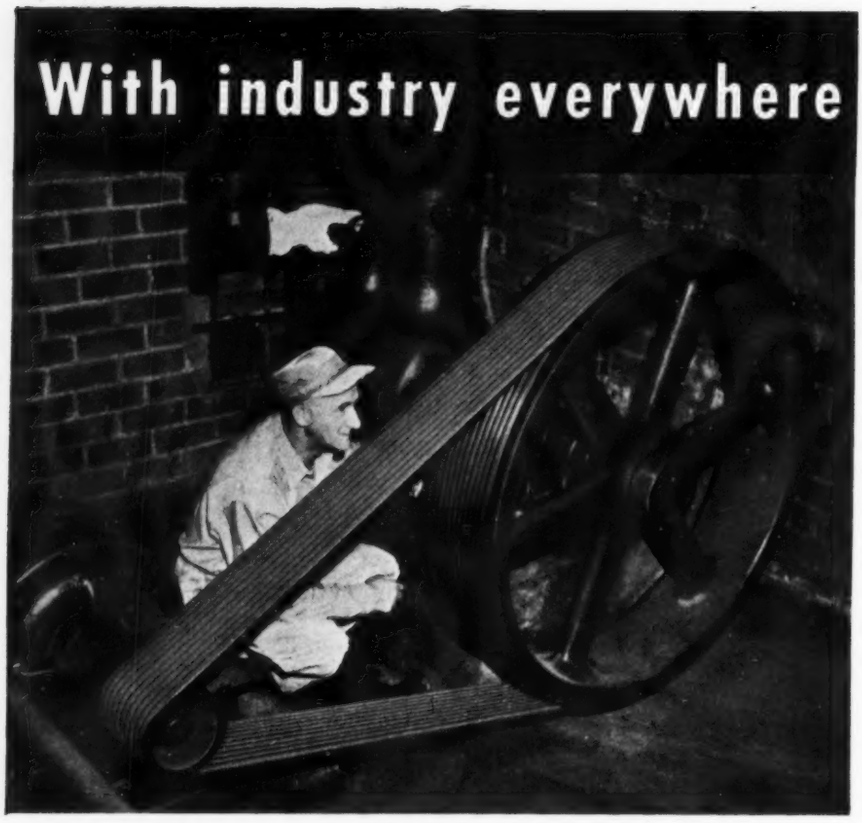


Double End Tenoner

Easy, fast set-up . . . operator can stand between tool stands to make adjustments. So flexible any arbor can tilt 90° up — 90° down. Heavy duty Beams, Hold-downs, and Jenkins Piston-Type Chains carry stock squarely through cutting tools for precision work. Does the work of big tenoner at less than half the cost.

Write for details today!

MANUFACTURED BY THE KOHLER-JOA CORP. SHEBOYGAN FALLS, WISCONSIN



the No. 1 choice is the V-belt with concave sides

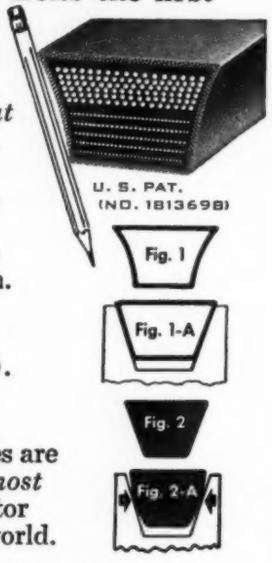
It is easy to see why concave sides insure far longer belt life...and make Gates V-Belts the first choice of industry everywhere.

Just *make this simple test:* bend a Gates V-Belt as if it were going around a sheave. Feel how the concave sides (Fig. 1) *fill out* ... become perfectly straight (Fig. 1-A).

Note how this belt thus makes full contact with the sides of a sheave ... grips the sheave evenly, distributing wear uniformly across the sides of the belt. Uniform wear lengthens belt life — keeps costs down.

With a straight-sided belt (Fig. 2) the sides *bulge out* when the belt is bent, and wear is concentrated on the bulge (Fig. 2-A). Uneven wear shortens belt life — increases belt costs.

Because Gates V-Belts with concave sides are so universally preferred, they are also the *most widely available.* There are Gates Distributor stocks in industrial centers throughout the world.



The Gates Rubber Company, Denver, Colorado

Gates *World's Largest Maker of V-Belts* TPA 351

Gates VULCO ROPE Drives

Letters To The Editor

"Your issues of February and March, 1958, have articles titled, 'Wonders in Birchland.' Our Sales Department would like to know if you have reprints of these articles and if not, would you be so kind as to give us permission to copy the articles to forward to our coast-to-coast sales force?"

—S. D., CALIF.

"I read your article, 'Refresher Course On Animal Adhesives,' in the September issue. I would very much appreciate receiving a copy of the article. The magazine is available in our company library, but I would appreciate having a copy for my own file."

—R. V., ILLINOIS

"We are interested in finding a source for 1000 tapered hardwood legs, 28" to 29" long, preferably with brass ferrule tip without any kind of swivel. We would not need metal mounting brackets."

—J. E., LOUISIANA

"Sixty years of service is a record of which you folks can be very proud. I am sure that you will have sixty more years of service and of successful growth."

—H. G., ILLINOIS

"I am investigating different fields of endeavor, trying to decide upon a career. Could you help me? Please send a copy of your publication for examination. It may help me decide."

—G. O., ILLINOIS

"Reference is made to the August, 1958, issue, the article called 'Dry Process for Manufacturing Hardboard' page 37. If at all possible, we would like to receive two or three copies of this article."

—A. G., NEW YORK

"Having the responsibility of supervising a furniture dimension operation, I am at a point where information on waste percentages of like operations would be very helpful. I am primarily interested in average waste percentage of various grades and species of rough lumber through dimensioning of core stock, semi- and fully dimensioned furniture components. Please send me any data you may have."

—R. K., TEXAS

MASONITE MAKES THE NEWS

. . . by supplying a hardboard that's a wonder of workability

- Saws cleanly
- Drills neatly
- Routs smoothly
- Curves beautifully
- Bonds firmly
- Fastens securely

Whatever your design or production need, Masonite has the hardboard to do the job.

MASONITE® Panel Products

®Masonite Corporation—manufacturer of quality panel products.

Masonite Corporation
Dept. 4-3
Box 777, Chicago 90, Illinois

☐ Please send latest design and production information on Masonite panel products.

☐ Please have your sales engineer call.

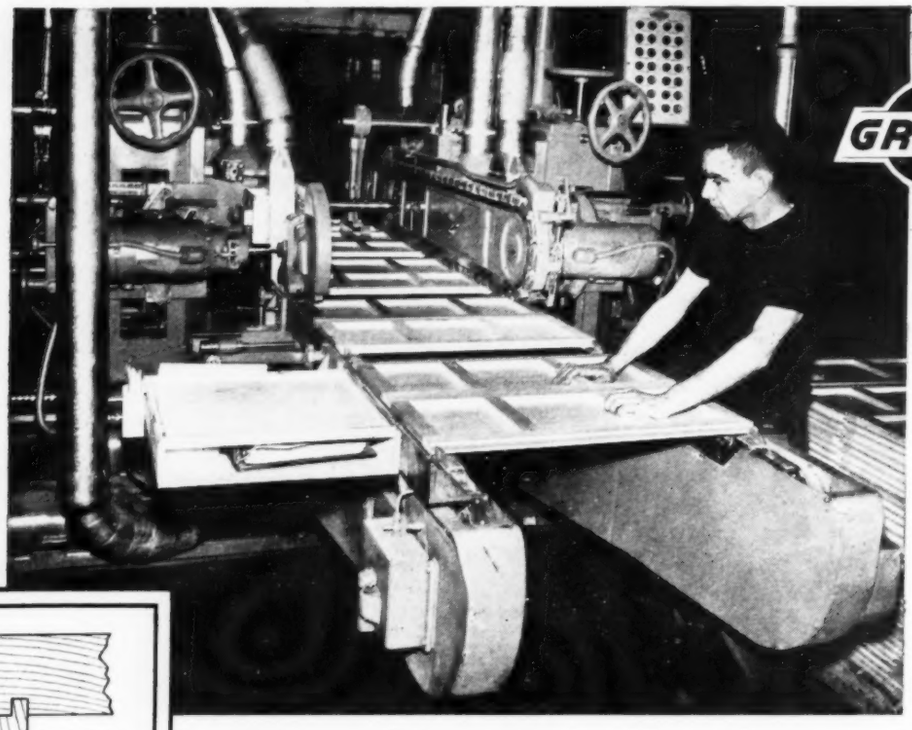
Name.....

Address.....

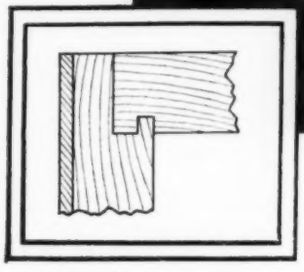
City.....*State*.....

Zone.....*County*.....

GREENLEE SPECIALIZED MACHINES PRODUCE GREATER PROFITS

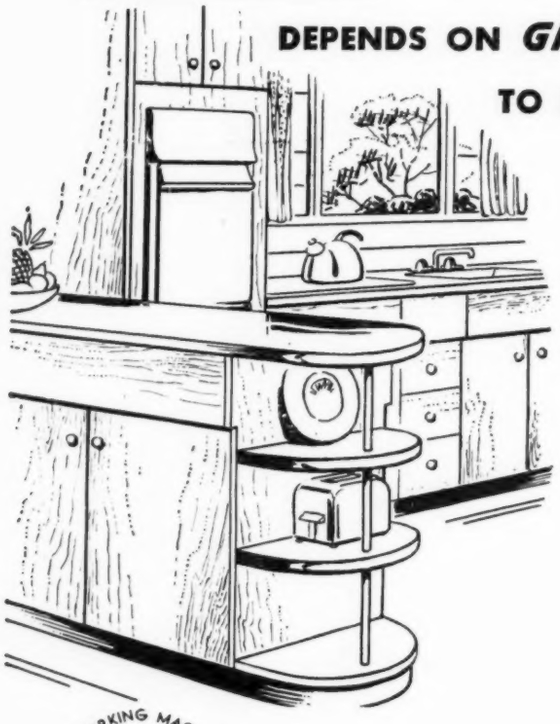


MACHINERY & TOOLS
GREENLEE



MORGAN

DEPENDS ON *GREENLEE* No. 545 DOUBLE-END TENONER TO PRODUCE ACCURATE LOCK-CORNER JOINTS



Wood cabinets for kitchens manufactured by Morgan Company, Oshkosh, Wisconsin have many exclusive features. One of these is the Morgan self-aligning lock joint which makes assembly easy . . . holds cabinets true and square.

These joints are cut in the cabinet end-panels at the rate of 600 per hour on the Greenlee No. 545 Double-End Tenoner shown above. Necessarily, close tolerances are of utmost importance. On an average run of 20,000 pieces, plant officials say the Greenlee "545" will hold to .008" at all times.

Set-ups are easily and quickly made. Swinging pressure beams give complete access to the cutting heads, reducing down-time to a minimum.

Let us show you how the Greenlee No. 545 Double-End Tenoner can cut costs in your plant. Write today for complete information.

Put a Profit in Your Woodworking with Greenlee Machines

WOODWORKING MACHINERY MANUFACTURERS' ASSOCIATION WMMA

GREENLEE BROS. & CO.

1932 TWENTY-FIRST AVE.
ROCKFORD, ILL.

For information about any advertised product, see the Advertisers Index and Action Card inside back cover

Get IN LINE with today's gluing trend!

SWITCH TO RCI's 9153 PLYAMUL

• Want to know why the woodworking industry is turning from animal glues to RCI's 9153 PLYAMUL for an increasing variety of applications?

Always ready for use and easy to apply, this quick-setting Reichhold polyvinyl acetate adhesive permits continuous operation of automatic equipment. Because it does not "cake" like animal glues, fewer costly shutdowns for cleaning are required.

In addition to gluing furniture joints, versatile 9153 PLYAMUL is recommended for bonding plastic overlay and phenolic-impregnated backing sheets to particle board, plywood and lumber panels; for edge-gluing lumber cores; for no-clamp production of hollow-core doors; and for laminating waste lumber parts into marketable products.

For complete information on 9153 PLYAMUL, write to Reichhold today for Technical Bulletin G-11.

REICHHOLD

Synthetic Resins • Chemical Colors • Industrial Adhesives • Phenol
Hydrochloric Acid • Formaldehyde • Glycerine • Phthalic Anhydride
Maleic Anhydride • Sebacic Acid • Ortho-Phenylphenol • Sodium Sulfite
Pentaerythritol • Pentachlorophenol • Sodium Pentachlorophenate
Sulfuric Acid • Methanol

RCI *Creative Chemistry ...*
Your Partner in Progress

REICHHOLD CHEMICALS, INC., RCI BUILDING, WHITE PLAINS, N.Y.

to management

How's Business?

The nation's leading economists are far more optimistic about the business outlook than they were at this time last year. Most economists believe that the gross national product will rise above its mid-1958 level during 1959. They also think that industrial production will show a similar trend.

Inflation fears, as expressed by almost daily new stock market highs, are looking far ahead of the current price lull. Bumper meat and crop supplies, upward pressures in raw materials and some industrial goods will be offset, thus keeping the total cost of living relatively stable in the first half of 1959.

Production, employment, income, retail sales and outlays for construction continue to rise. The improvement in business that began in early spring continues on a broad front, and is providing a firm base for further expansion of economic activity in the months ahead.

News in Legislative Matters

This new Congress is thought by some to be closer to a labor government than any Congress previously. There will be many matters coming up for legislation. Some proposed legislation is being announced in advance in order to gain interest—there will be some hot political battles between and within political parties.

More economy in government—President Eisenhower wants more economy, but the Federal budget chiefs are currently engaged in the preparation of fiscal 1959-60 estimates that will call for a budget of approximately $80 billion—a record peacetime high.

Tax relief—could be provided by permitting faster write-offs on new plants and equipment, cutting top rates on higher incomes, and shaving the 52% corporate tax rate back to 50%. However, there are some staunch economy advocates that wish to wait until the budget is in the black before moving toward tax relief.

AFL-CIO wants a number of things: more civil rights legislation; low interest loans to municipalities for public works and aid for depressed areas; Federal funds for school construction and higher teacher salaries; medical insurance for old-age pensioners; resources development such as TVA; higher unemployment pay; a hike in the minimum pay wage from $1 to $1.25 an hour; more government aid for public housing and a slum clearance program.

A detailed analysis of the special initial write-off available under the new tax law has been prepared by the Machinery and Allied Products Institute. Copies of the pamphlet, "Effect of the New Initial Write-off on Business Investment," may be obtained for 25c from MAPI, 1200 18 St., N.W., Washington, D.C.

Research

Packaging has been studied as a sales hook of growing importance. An example is the display by the U. S. Plywood Adhesive and Finishes Division. The unit promotes impulse sales. The display of adhesives comes with a self-selector chart, prominently affixed, which answers questions shoppers would be likely to ask.

Furniture makers have been using packaging cartons imprinted with identification of product and advertising message. This trend should continue and find greater utilization. Many wood products—trays, game boards, toys, etc.,—can be stored by the consumer in the original container if it is sturdy, attractive and saves space in the home.

"Standing room only," is becoming a realistic prospect for the end of this century. Recent U. N. projections of population show even larger gains than those indicated for the U. S., with Asia and Latin America making the biggest gains.

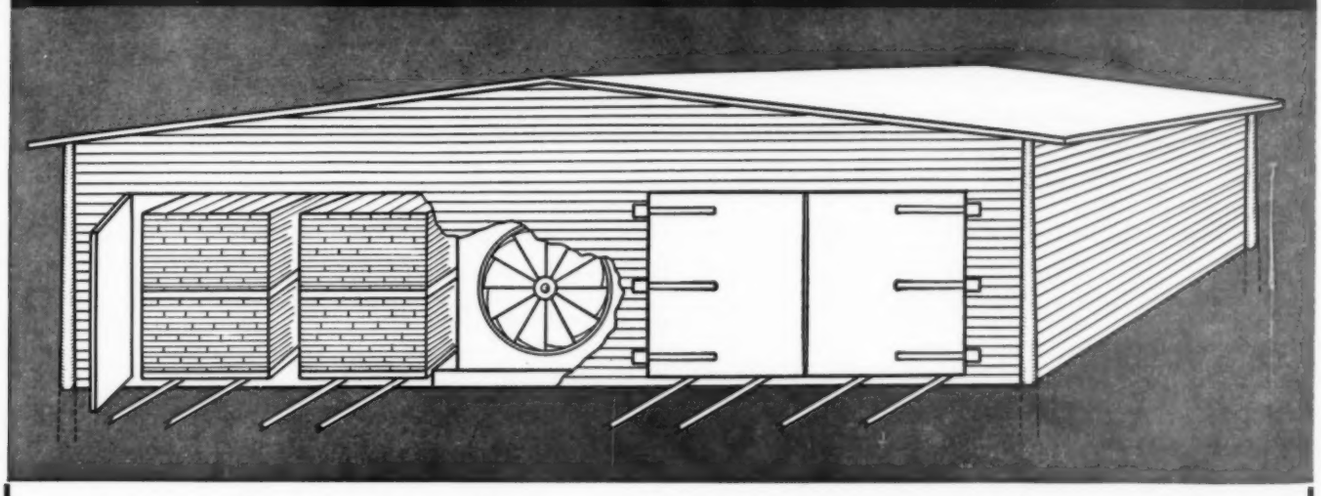
The U.S. Bureau of the Census has recently released a series of population projections for 1960-1980. These new projections involve changed estimates for major age groups of special interest to many lines of business—teen-agers, college age, youngsters, working age groups and oldsters over 65. If interested in updating your merchandising plans, write for "Illustrative Projections of the Population of the U.S., by Age and Sex, 1960-80," from the Bureau of the Census, Washington 25, D.C., for 25c.

A wood tower was used for the first time in an atomic blast, reports the National Lumber Manufacturers Association. For the first time during test operations in the Nevada desert, an atomic blast has been set off atop a wood tower. The operation which took place in mid-October, involved a "pipsqueak" detonation from a 150′ wood stand.

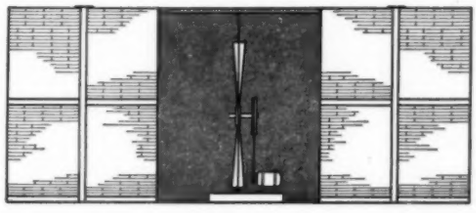
Advantages of the wood tower, according to scientists is that it yields little radioactive material. Steel towers, ordinarily used for above-ground test blasts, vaporize and become radioactive. The "pipsqueak" tests are designed to perfect small atomic weapons for battlefield use.

MOORE FORCED AIR DRYER

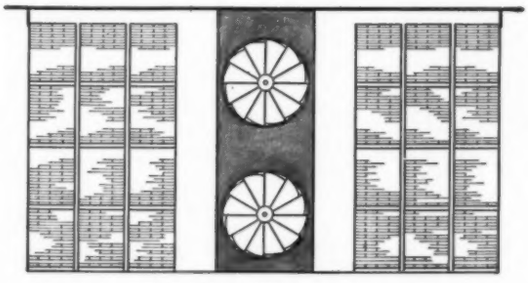
The NEW Low-Cost System For Drying Lumber



A Dryer for Any Capacity— 5000 Bd. Ft. and Up



This inexpensive design handles as little as 5000 bd. ft. For portable or permanent installation.



Moore Forced Air Dryer designed for large holding capacity. Other designs also available.

Here's the answer to a lumberman's prayer: A dependable, low-cost system to season pine and hardwoods to air-dried moisture content specifications.

The Moore Forced Air Dryer seasons 6 to 10 times faster than Mother Nature. Now you can ship lumber in a few days, at a fraction of the cost of handling and yard drying.

1—Produces brighter, flatter lumber (reduces stain and other yard drying defects)
2—Turns your inventory faster (money in your pocket)
3—Reduces shipping costs (don't pay freight on water)
4—Designed for loads on rails or unit packages
5—Increases existing kiln capacity (speeds air-drying before kiln drying)
6—Low equipment and building cost

Write today for estimate on a Moore Forced Air Dryer to fit your needs.

MOORE DRY KILN COMPANY

Oldest and Largest Manufacturers of Dry Kilns and Veneer Dryers

JACKSONVILLE FLORIDA | BRAMPTON, ONT. CANADA | VANCOUVER, B. C. CANADA | NORTH PORTLAND OREGON

Comments From The Editor On New Products, Industry Trends and Current Events

At least one woodworking company has taken advantage of the new 4c conservation stamp as advertising aid. Lee Millwork Corp., Fair Lawn, N.J., sent a mailing on their "Lee-Bow" window in specially designed envelopes printed in two colors. An evergreen forest seen through the Lee-Bow window was depicted with the legend, "Good Forestry Is Good Business For Us All." The mailing was sent to Tucson, Ariz., postoffice where the new 4c forest conservation stamp was affixed and a "first day of issue" cancellation mark.

A new concept in homebuilding, the use of modular panels featuring both interior and exterior finishes molded to a foamed polystyrene core will be demonstrated at the National Association of Home Builders convention in Chicago in January.

Two regular contributors to Hitchcock's WOOD WORKING were speakers at a recent conference on utilization of beech. Paul H. Graham and Nelson Nash were both on the conference program which was sponsored by the Northeastern Loggers' Association and the Vermont Bureau of Industrial Research.

The U. S. Department of Agriculture's Forest Research Advisory Committee has recommended that research be directed toward epidemic diseases and insect infestations of forest trees.

In regard to the research on forest tree diseases and insects, the committee observed that thorough knowledge of causes and behavior patterns of insect and disease outbreaks is essential to effective control, and specified the need for studies of sugar maple blight, oak wilt, Hypoxylon canker (of aspens), Douglas fir bettle, and spruce budworm.

Legislative efforts to bring the wood industry out of its maze of conflicting and confusing terms of identification at the consumer level will begin shortly when Congress starts considering HR 13503 and HR 13490, called the "Decorative Wood and/or Imitation Wood Products Labeling Act." One aim of the act is to provide the consumer with correct and understandable information about products made from wood, and it makes it a misdemeanor to "manufacture, promote, advertise, sell or distribute" any finished wood product if it has been mislabeled, not labeled, or falsely or deceptively advertised or invoiced.

On all imitation wood products, it provides that the label must re-

dress 4 sides at 1 time
New FAY & EGAN
FOUR-SIDE PLANER-MATCHER MOULDER
model 969
Mould shapes like these . . . in one operation!
FOUR SIDE DRESSING
DOUBLE SURFACING
TONGUE & GROOVE SHEETING
SHIP LAPPING
DROP SIDING
BEADED SIDING
FLOORING
MOULDINGS
Four-side dressing in one operation
Double surfaces
Capacity to 20" wide, 8" thick and 4" four-side
Ball bearing motors for smooth running, high-speed operation
For flooring, moulding, siding production, this new Model 969 Planer-Matcher-Moulder speeds operations on all four sides at one time!
Sturdy construction, rugged ball bearing motors, four knife safety type round cylinders . . . Top quality features assure low-cost production and years of trouble-free service.
Convenient controls permit easy adjustments. Matcher units may be adjusted even when in operation.
Write Today for complete informative brochure
FAY & EGAN CO.
2023 Eastern Ave., Cincinnati 2, Ohio
World's Oldest Manufacturers of Woodworking Machinery

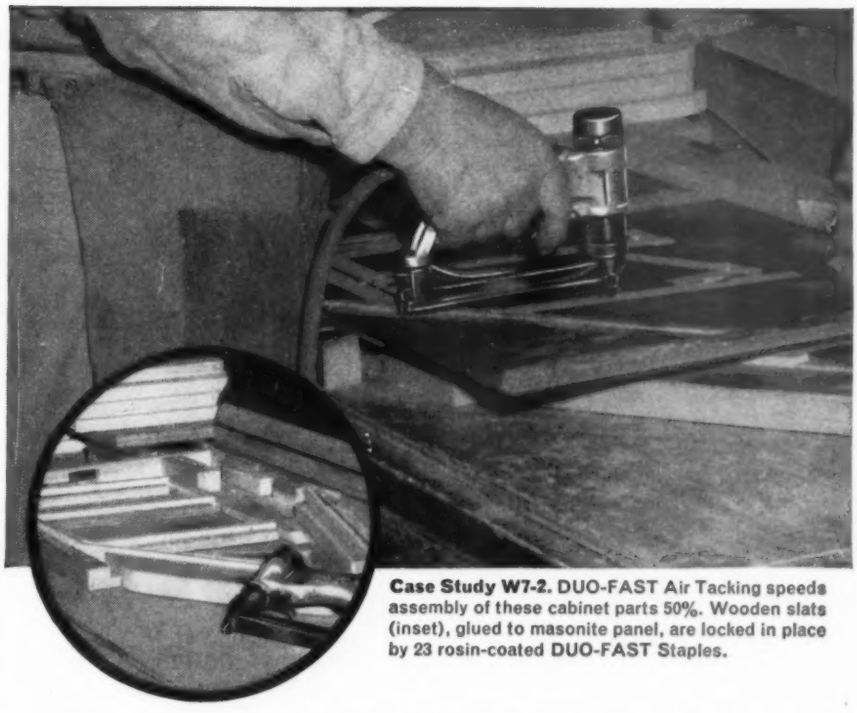
veal the true generic name of the material actually used and the common name of the wood species imitated preceded by the word "imitation" as, for example, "fiberboard, imitation walnut finish." Labels on genuine wood products must show the common name of the wood or woods used on wholly or partially exposed surfaces as, for example, "flat surfaces, genuine African mahogany; lumber surfaces, gum, imitation mahogany finish.

Cash income from Indian-owned forests in the United States has trebled in the last decade and the interest of Indian tribes and individual Indians in the scientific management of their woodland assets has greatly increased during the same period. There are 6,600,000 acres of commercially valuable forestland under supervision of the U. S. Department of the Interior, Bureau of Indian Affairs.

The Food and Agricultural Organization of the United Nations (FAO) says there is every evidence that the world can produce 2000 million cubic meters of industrial wood annually—its estimated requirements—by the end of this century. Good management practices help guarantee a sufficient supply. This report parallels the statement made in a U. S. Forest Service report earlier this year: "Total wood growth in the U.S. now exceeds removal by 25%, notwithstanding a growing population and increasing demands for wood."

Construction in 1959 will set new records, both in contracts awarded and in work put in place, according to the annual outlook statement of the F. W. Dodge Corp. Contracts in 1959 for all types of construction will total $35.6 billion, a 3% increase over this year's estimated $34.7 billion, according to the Dodge figures.

Readers will be glad to see another article on the American hardwood series in this issue. Read the adventures of Peter Linden at Basswood Bluff, and your respect for bass will grow. The second installment is scheduled for publication in January.



Case Study W7-2. DUO-FAST Air Tacking speeds assembly of these cabinet parts 50%. Wooden slats (inset), glued to masonite panel, are locked in place by 23 rosin-coated DUO-FAST Staples.

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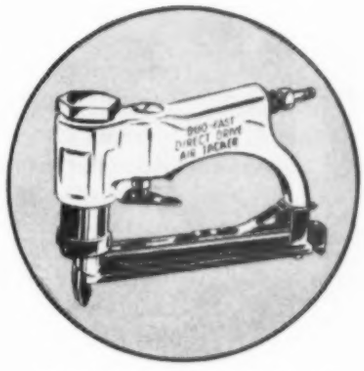

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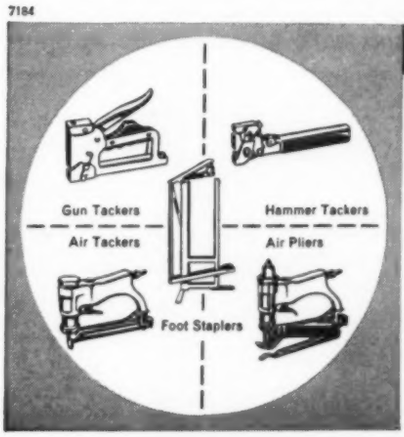

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WOOD WORKING

The Editor's Page

CHRISTMAS GREETINGS

And so it's Christmas once again! Hard feelings are set aside and men forget to be selfish. Love, contagious-like, leaps from heart to heart. It's easy to be generous and gracious with goodwill toward all—at Christmas time.

But what a contrast between the few days of goodwill and the months of "me first"! Perhaps this contrast causes many people to believe that it is sophisticated to be above the sentiment of Christmas and beyond the touch of any religious symbolism.

It was Henry Van Dyke who pointed out the difference between *observing* and *keeping* Christmas. In his "The Spirit of Christmas" he expresses the thought that it is a good thing to observe Christmas because it helps one to feel the supremacy of the common life over the individual life. But better than observing Christmas day, he believed, is keeping Christmas 365 days a year.

How is this done? We are so busy buying and selling at this season that there is little time to think about it. However, there are those who believe that *keeping* Christmas must begin with the acceptance of a gift—the first Christmas Gift, if you like. St. John put it in these words:

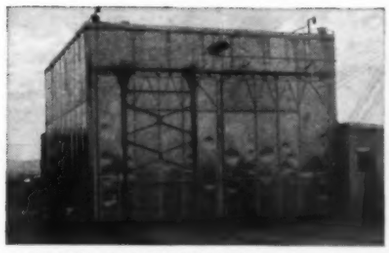
> *"For God so loved the world that He gave His only begotten Son that whosoever believeth in Him should not perish, but have everlasting life."*
>
> *—John 3:16, The Bible.*

That was the first Christmas Gift—a Gift that changes all of life for any who will freely accept it. To live for God and Christ—rather than for self—is to love and care more for the happiness of others than we do for our own.

If we live this way, we, too, have found our way to Bethlehem and the true meaning of Christmas. We have discovered for ourselves that in the birth of Christ, light was given which no darkness can extinguish.

This route to vital, forceful living is never closed. Let us travel it and discover for ourselves the Christ of Christmas.

E. McDaniel
Editor



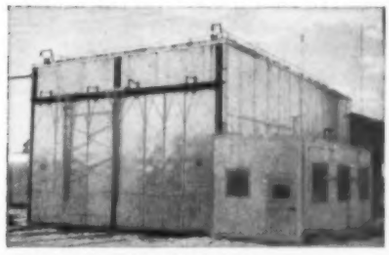
FOREST PRODUCTS COMPANY has stepped up to **STANDARD**—This installation at Albuquerque, New Mexico, consists of a gas-fired Standard prefabricated kiln which requires no boiler. Used primarily to dry Ponderosa pine, the kiln insures the quality of the firm's molding products.

Step up to STANDARD

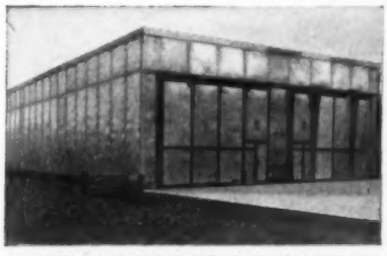
for uniformly-dried lumber at lowest possible cost

● For any type of new kiln installation, or for remodeling of old natural draft kilns, call on Standard—manufacturers and designers of today's finest internal-fan kilns—to solve *your* drying requirements *best*. Write for information, and a free copy of our complete Equipment Catalog and Prefab Kiln Brochure.

TELL CITY CHAIR COMPANY has stepped up to **STANDARD**—Located at Tell City, Indiana, this long-established firm reports: "We have been operating our two Standard package kilns since 1952, and are more than pleased with them. Their design gives better circulation and heat control than we ever achieved with our larger track kilns. We're able to segregate mixed loads and thus get maximum capacity."



CHAMA LUMBER COMPANY has stepped up to **STANDARD**—This Chama, New Mexico, firm has a Standard gas-fired prefabricated kiln. No boiler is required. Used mainly to dry Engelmann's spruce, the kiln holds in the neighborhood of 80,000 feet of lumber.



CRAWFORD FURNITURE MANUFACTURING CORPORATION has stepped up to **STANDARD**—Crawford selected Standard prefabricated kilns for its modern furniture plant in New Bethlehem, Pa. Each of the two kilns is 20' wide x 100' long.

REMEMBER,

quality control starts with your dry kiln. Make sure it's the finest—make sure it's Standard.

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The False Face Society dancers of Onandaga, New York, have gone to a great deal of trouble to preserve the historic basswood false face ceremonies of the Iroquois, held for the purpose of exorcising evil spirits and driving away diseases.

- *Here's a "Western" that takes place in the northeastern part of our country.*
- *Peter Linden challenges the local muscle man, Big Limey. Who wins?*
- *Is basswood really worth defending?*
- *Final outcome will be told in next month's installment.*

American Hardwood Series . . .

BOOMING RACKETS IN

Basswood Bluff—"a honey of a town"—lies somewhere in the northeastern part of the U.S., in the county of Beeswax.

A stranger was rapidly approaching on horseback, raising a cloud of dust. Riding through the Indian reservation on the outskirts of the town, he passed a squaw carrying her baby on her back in a traditional basswood contraption. In rhythm with his horses' hoofs the stranger muttered these lines from Longfellow:

By the shores of Gitchie Gummee,
By the shining big sea water . . .
There the wrinkled old Nokomis
Nursed the little Hiawatha.
Rocked him in his linden cradle

The stranger smiled. His own name was Peter Linden, which is European for basswood. Yep, these Indians had a most astonishing program of basswood utilization. Anticipating surrealism, their artists carved frightening faces into the trunks of living trees. These gruesome masks had great medicinal powers and were especially valuable in the treatment of juvenile delinquents. Carving masks kept them busy and out of trouble.

Reaching the center of town, Peter Linden tied his horse to the hitching post and strode through the swinging basswood louvered doors into the saloon, which was just being redecorated. However, business went on as usual. The floor was littered with open paint cans from which little basswood stirring paddles protruded.

"Shorty" Whitewood, the town's contractor, architect, specification writer and handyman was lugging a huge ladder around, which had basswood siderails. Shorty was taking some measurements with a basswood yardstick.

"Nothing like a hardwood basswood yardstick," said Shorty to nobody in particular. "It's light in color, light in weight, soft in texture and the markings are deeply embedded. Look, I inherited this ruler from my old man, and you can still see every line, every number. In all this time they haven't rubbed off!"

"Big Limey," who was downing his fifty fifth said belligerently, "You're crazy, your father was crazy, and anybody here who agrees with you is crazy! *I* say, basswood is a *softwood*. Any objections?"

The poor, neurotic, frustrated, inferiority-complex-ridden cowboys around the bar had no objections. Big Limey's word was law in those parts. He grabbed the basswood ruler from Shorty and broke it in two. However, because of basswood's unusually long and elastic fibres he had to bend the stick almost into a full circle before it reached the breaking point.

"Fill'em up, bartender," shouted Big Limey triumphantly, "the drinks are on the house."

Everybody was having a ball, except poor Shorty who was pushed down from the ladder and was now lying writhing on the floor. After a while "Doc," th town's vet, went over to him, stuck a basswood tongue depressor in his mouth and proclaimed: "Arm broke."

Administering first aid with a basswood splint from his bag, "Doc" growled, "You idiot. You shoudda kept still."

BASSWOOD BLUFF

By Nelson Nash

Peter Linden had seen enough. He could stand no more. Ambling over to Big Limey with a mint flavored basswood toothpick dangling from his teeth, he drawled. "You haven't convinced *me*, mister. I still think that botanically speaking basswood is a hardwood. Amongst people of culture and refinement we call it *deciduous*—this means the tree has large, heart-shaped leaves which fall off in the autumn. O.K. so the wood is soft. But it is not as soft as you are in the head, Mr. Big Limey."

Nobody had ever dared to speak to Big Limey like this before. Livid with rage, Big Limey turned to the man with the tin star on his caved-in chest and roared, "Sheriff! Ain't I payin' you off enough? You gonna let this . . . this . . . this . . . insult me in me own town?"

"Now, looka here, fellow," said the frightened, trembling sheriff to Peter Linden. But Peter could not be stopped.

"And let me tell you something else about basswood," Peter continued. "Basswood is probably the most beloved and underrated of all American woods. It combines the best features of hardwoods and softwoods in its fibres. It is sturdy and strong in use, yet it is very lightweight and easily worked, glued and finished. It is kind and gentle to woodworking machinery. It grows over a large part of the eastern U.S.—from Maine to Minnesota and south to Kansas and Delaware. Anyone who slanders basswood is guilty of un-Americanism."

Big Limey choked with fury. He screamed,—"You'll pay for this, you hear. You'll have to fight a duel. Name your weapons!"

Peter Linden replied without hesitation, "Basswood tennis rackets!"

A shudder went through the group. Some almost felt sorry for poor Peter. Didn't he know that Big Limey had the most ferocious, fastest cannonball service in Beeswax County?

Peter didn't know, and he said nonchalantly, "High noon tomorrow. And when I say tennis' I mean the real thing. Not basswood-plywood ping-pong bats nor basswood badminton games."

He left the saloon walking backwards through the swinging doors. And because he thus could not see where he was going, Peter almost lost his life in a violent collision with a basswood hobby horse. The horses's youthful rider shouted, "Thank heavens that basswood has such strong paint holding properties! Lucky for you that my hobby horse is not scratched, or else I'd have . . ."

While the cruel townspeople roared with laughter, the little boy helped Peter to his feet and whispered in his ear, "Follow me, stranger. Someone wants to see you."

Galloping silently behind the boy, Peter Linden suddenly understood why the Basswood Bluff Chamber of Commerce used the slogan, "Honey of A Town."

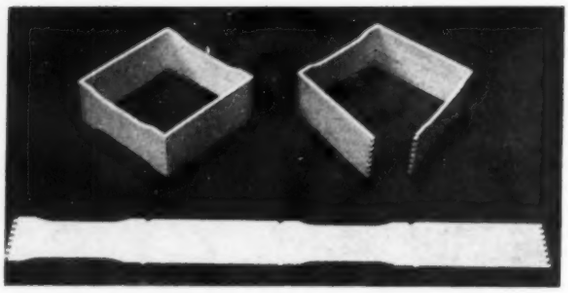
The streets and roads were lined with magnificent basswood trees, and millions of happily buzzing bees were eagerly sucking sweet, white, fragrant and rather strong-flavored nectar from the golden, blooming flowers. Finally, they arrived at the Bizzy-Bar-Bee Ranch. The boy led Peter to a young woman, Tilia, who was attending to her beehives.

"Howdy, Ma'm," said Peter. "I'm . . ."

"I know all about you," said Tilia. "Oh, you silly, stupid, dumb, wonderful fool you. But take my warning. Don't play tennis with Big Limey. Get out of town immediately."

"Nope," said Peter. "I must stay and defend the honor of basswood, which is one of our most modest and retiring species. Because of it's softwood-like lightness and it's hardwood-like strength it serves humanity quietly, efficiently and unobtrusively in a thousand ways. Most of the time as an 'undercover agent', quite hidden from view. It's

Skilled artists of the Iroquois Indiana "Secret Medicine Society" carved their ritual masks right on the trunk of a living basswood tree. After the mask had been roughly blocked out, the entire block was cut off the tree. The features which were carefully carved in high relief were painted black, red or black and red, depending upon which demon had to be pacified. Long strands of hair were also made of basswood cordage.



View of "sections" or honey boxes. Note that the box is made from one strip of basswood. "V" grooves permit easy assembly.

about time more appreciation was shown towards basswood."

Tilia began to weep. "I know how you must feel. It's useless, though. Big Limey will murder you. He has the fastest racket in these parts. Tomorrow I cannot help you. Tomorrow I will have to marry Big Limey, so that my father can come out of jail."

"I don't rightly understand, Ma'am."

It's like this," said Tilia. "When you came out here, you must have noticed all the basswood trees and the bees. Well, Basswood Bluff is the honey capital of the world. But Big Limey has forced all the producers here to sell only to him at his low prices. My pappy didn't like this, and he sold his honey directly to the big food chains in the city. Therefore, Big Limey had my pappy locked up. That's why I must marry him tomorrow, so my pappy will be released. Therefore, please don't do anything to upset Big Limey! Please—for me—get out while the getting is good."

Through clinced lips Peter asked, "But do you love him, Tilia?"

Unfortunately, her reply was not audible, because Peter's intelligent horse emitted a fierce "Neigh."

Changing the subject, Tilia said, "The reason Big Limey wants to marry me is because my bees are the best trained. They collect the nectar from the golden flowers of the basswood trees and deposit it here in these basswood 'sections' or boxes. As my pappy used to say before he was jailed: *'Honey cometh from basswood, and to basswood it shall return.'* "

Tilia then further explained that business was booming, because honey had recently been rediscovered by modern medicine. Doctors are again reading the Bible, which contains many references praising the virtues of honey. "Eat thou honey, because it is good, and the honeycomb which is sweet to thy taste," (*Proverbs*). Or, "Honey shall he eat, that he may know to refuse evil and choose the good," (*Isaiah*).

This old miracle-drug obviously must have worked, because even centuries later, Hippocrates, "the father of medicine," still wrote out prescriptions consisting of honey, wine, vegetables and fruit. Nothing old-fashioned about that!

There are several reasons why beekeepers prefer basswood for the "sections" in which honey is sold. Basswood has unusually long fibres, which permit V-grooving across the grain to almost paper-thinness. Unbelieveable as it may sound, this groove is so tough that it can be bent to form a right angle without breaking the piece of wood. Thus a box is easily and quickly formed *from a single strip of wood.*

In addition, basswood is also relatively taste- and odorless and can be selected without excessive waste to yield the white or near-white color desirable for use with a food product.

But now, Peter Linden was more determined than ever to defend the good name of basswood. So, Tilia prepared him a meal, using the best family silver, which was kept in a beautiful, distinctive silverware chest made from basswood, and covered with tooled leather. The interior parts, namely intricately machined racking and partitions, are also made of basswood and covered with anti-tarnish cloth.

Returning to his hotel room that night, Peter closed the highly flexible basswood Venetian blinds. The fact remains, that no window dressing has even closely approached the combined charm, beauty and utility of a wood blind. It is right at home in the most elegant surroundings. which in most cases are also made of wood. As to utility, it is in a class by itself. Wood is an insulator against heat and cold, not, a conductor. Therefore, wood blinds do not radiate heat and they are 'dripless', because they do not accumulate water of condensation.

The flat wood slat makes possible much more light, ventilation and visibility without glare or draft. When only partially tilted, it affords complete privacy from outside without darkness or seclusion. Certainly, no other window dressing can offer as much.

Alone at last, Peter prepared himself for to-morrow's ordeal by exercising with a pair of basswood Indian clubs. Catching a glimpse of himself in the basswood framed, gilded mirror he said admiringly to himself, "I'm a match for him, you bet!"

(To Be Continued Next Month.)

Thank You!

Data and photographs for Part I of this article has been furnished by:

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Catalog Describes Boice-Crane Tools

A recently announced belt sander is one of the new tools fully described and illustrated in the 52-page catalog issued by the Boice-Crane Company.

Full details are included on a line of band saws, contour saws and band filters, jig saws, saw jointers, saw tables, shapers and shaper cutters, drill presses, tool and knife grinders, jointers, lathes, planers, belt and spindle sanders, spinning tools, motors, etc.

A copy will be sent to anyone requesting it from the Boice-Crane Company, 931 W. Central Ave., Toledo 6, Ohio.

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Automatic Recorder-Controller For Lumber Dry Kilns

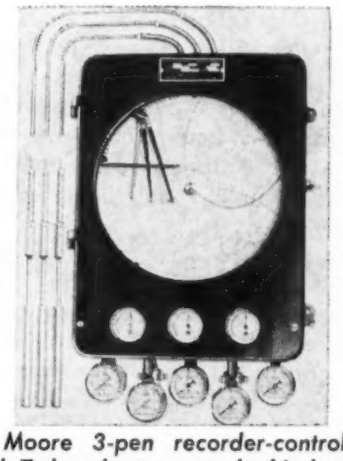
This paper was prepared earlier this year by Dr. Harold B. Gatlick and William L. Day of the State University, College of Forestry, Syracuse University, Syracuse, N.Y. Dr. Gatslick is now on the faculty of the University of Massachusetts.

Drying of lumber and other wood products is fast moving toward the pushbutton age. Fortunately, this does not mean elaborate, expensive kilns and control equipment manned by a battery of trained technicians. Conversely, it is the control of drying processes with a resultant *decrease in cost* and *increase in yield and quality of drying*. This has been made possible by the advent of modern automatic recorder-controllers in dry kiln work and their continued development based on production experience.

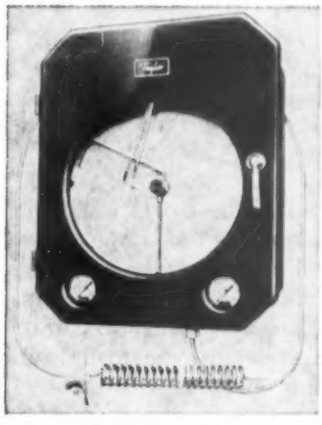
The automatic recorder-controller is by no means a panacea for seasoning problems, but it does allow for control within 1° F., and provides a means for quality drying with a minimum of guesswork. Instead of having the kiln operator tied continuously to the control valves, an automatic controller performs that function. In a large plant, this releases the kiln operator and enables him to run the controls on a number of kilns. In the small plant, it allows a plant supervisor or other administrator to oversee the kiln operation without being a slave to manual controls.

The saving in steam results from close, accurate control of both temperature and humidity. Under a manual system of control, it is possible to pour steam into the kiln for hours when it is not needed to aid in the drying process. With automatic control, this is impossible since the humidity is controlled at a specific point.

In brief, the automatic recorder-controller can be made to control the *temperature* and *relative humidity* conditions in a kiln. This, in turn, means control of the drying rate and the level of stress per-

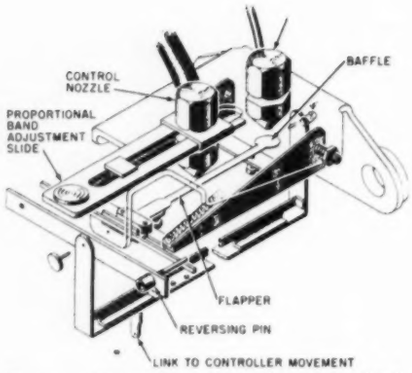


A Moore 3-pen recorder-controller with 7-day chart pre-marked in hours, showing the tubing and thermal elements.

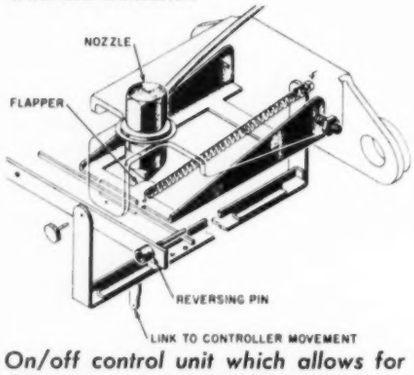


A 24-hour temperature pneumatic recorder-controller with a bulb designed for a fast response. Note the equal chart graduations and air supply gauges on this instrument.

Control room for a battery of kilns. Note the exposed air line filters and fan reversal timing cases.



Proportional control unit which throttles the control valve or clamps so that input is constantly in balance with the demand.



On/off control unit which allows for full open or closed valve operation when temperature crosses the set point.

mitted in the stock. Following the development of time schedules based on experience with the kilns, species timing schedule cams can be incorporated in the control system, reducing the major function of the operator to inspection and maintenance.

What Are the Major Control Variables

The four essentials of drying any form of wood with any system are *temperature, humidity, circulation,* and *ventilation.* In the infancy of kiln drying, only temperature was considered important; but as this science developed, it became evident that all these factors are important.

A natural development has been the substitution of automatic control and recording for manual methods so that in addition to attaining accurate control of the heat and humidity in kiln drying, a record is kept to improve future schedules. With the advent of reversible cross-circulation kilns and automatically controlled vents, it is now possible for the kiln operator to control all four elements of seasoning accurately, to produce proper conditions to fit the species and the thickness of the stock, and to produce the desired moisture content.

What Is the Difference Between Manual and Automatic Control?

Manual control—opening and closing control valves by hand according to the operator's judgment. It is extremely difficult to control temperatures by manually throttling the valve opening. Hand valves should be either wide open or shut. Partially opened valves result in "wire drawing" or cutting of the valve and the valve seat by the steam, which eventually renders the whole valve useless. Throttled valves often become clogged with scale and dirt. In kilns heated by steam coils, precision drying is impossible.

Automatic control—is accomplished by using a sensing bulb and a capillary tube. The resultant pressure from thermal expansion and contraction is used directly within a closed system to operate the valve, or indirectly to actuate a power source which operates the valve.

In the early days of kiln drying, all steam spray and heating lines were manually controlled by globe valves with the only control being mercury-filled glass thermometers. This was followed by the development of recording thermometers mercury-filled which employed a pressure-sensitive bulb. By magnifying the contraction and expansion occurring within the bulb to activate a pen, it was possible to make a permanent chart of the temperature fluctuations within the kiln. The next logical step was to combine temperature recording and controlling into a single unit, this was accomplished around 1915.

What Temperature Measuring Media Is Available?

The classes of instruments are determined by the material filling the pressure-sensitive components. These are divided into three classes: gas filled, vapor pressure and liquid filled.

The gas filled instruments employ an inert gas (usually nitrogen) which actuates the system by expansion and contraction. The gas filled instruments are capable of a good response in higher temperature ranges, but have only a fair response in the lower ranges. Instrument range is from –200° to 800° F.

Vapor pressure instruments are actuaged by variation in the vapor pressure of a volatile liquid (toluene, ethul ether, etc.) as the bulb temperature changes. Instrument range is from –50° to 600°F. There is good response in all ranges. This is the most common class of instrument in use.

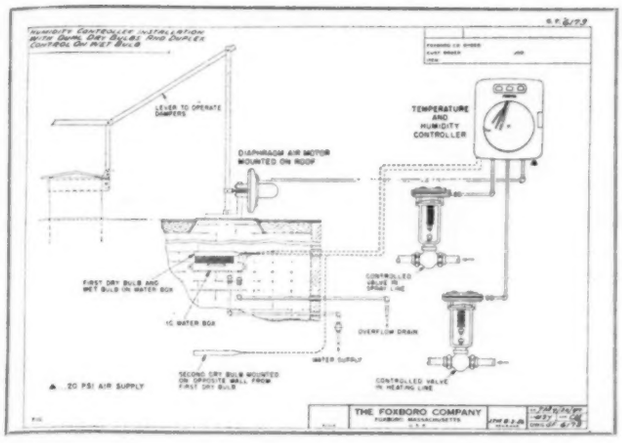
Liquid filled instruments are actuated by the pressure exerted from the volume change of the enclosed liquid with a change in bulb temperature. The liquid generally used is mercury. Range is from –35° to 1000°F. Good response is found in all ranges.

Recorder-controllers can be operated electrically or pneumatically. However, since the greatest majority of recorder-controllers are pneumatically operated, the descriptions in this article will refer to this type.

Any filled system thermometer consists of the bulb which is connected by capillary tubing to a mechanical element which is made of flattened tubing wound in a helix. Bulbs are generally copper coated with silver or chromium for corrosion resistance. The capillary tubing is generally cold drawn, seamless copper or stainless steel tubing.

The recording mechanism consists of an electrical or mechanical chart drive (clock mechanism) which rotates the chart under the pen at a fixed speed. The recording pens, in turn, chart the action of the fluctuating helix which telegraphs the temperature changes within the kiln.

The controlling mechanism is also housed in the instrument case. The mechanism consists of either a long pointer painted the same color as the corresponding pen, which may be set to indicate the desired temperature on the recording chart, or small indicators with their own dials which serve the same purpose.


HUMIDITY CONTROLLER INSTALLATION WITH DUAL DRY BULBS AND DUPLEX CONTROL ON WET BULB
LEVER TO OPERATE DAMPERS
DIAPHRAGM AIR MOTOR MOUNTED ON ROOF
TEMPERATURE AND HUMIDITY CONTROLLER
FIRST DRY BULB AND WET BULB ON WATER BOX
CONTROLLED VALVE IN SPRAY LINE
WATER BOX
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SECOND DRY BULB MOUNTED ON OPPOSITE WALL FROM FIRST DRY BULB
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20 PSI AIR SUPPLY
THE FOXBORO COMPANY
FOXBORO, MASSACHUSETTS
U.S.A.

Automatic recorder-controller installation with dual dry-bulb and Duplex control on wet-bulb (separate vent control).

How the Record-Controller System Operates

The system is filled with the volatile liquid, leaving space for vapor and vaporization in the bulb. As the temperature increases around the bulb (in the kiln), some of the liquid boils, producing a vapor pressure which is transmitted up the capillary tube and into the instrument spiral or helix. This forces the helix to unwind slightly, moving the attached yoke which magnifies the action and, in turn, transmits it to the recording pen. The pen marks the chart which is calibrated in degrees temperature corresponding to the vapor pressure in the bulb.

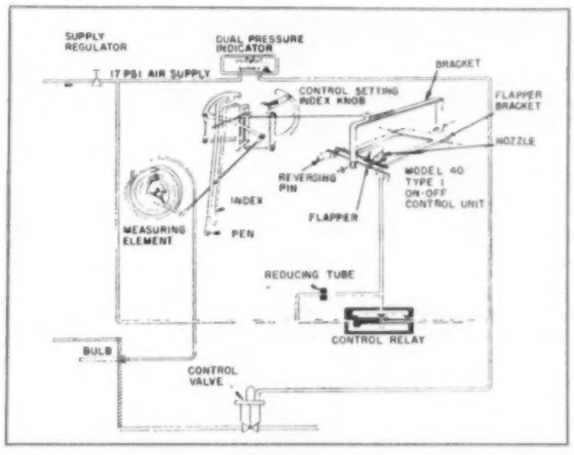
Simultaneously—and continuously—air is entering the instrument. It is discharged through a small nozzle attached to the wet- or dry-bulb indicating mechanism. As the temperature in the kiln increases, the pen arm approaches the setting of the indicator, and a small metal strip called the flapper, which is attached to the pen arm, approaches the nozzle orifice. As the temperature in the kiln attains the desired temperature, the flapper on the recording arm is firmly pressed over the nozzle. The air which has been heretofore discharged, backs up through tubing to a unidirectionally-operating diaphragm valve. This motion unseats a small valve, cutting off air to the diaphragm motor of the corresponding control valve (spray or heating line) which is then closed. When the valve is shut, kiln temperature or humidity begins to drop, and the recording pen carrying the flapper falls away from the nozzle, permitting the air to escape from the undirectional diaphragm. This allows air into the control valve once more, and the cycle repeats itself. This motion—generally referred to as "hunting"—is rapid and continuous.

Vent control in modern instruments is affected through separate control. The motor valves close prior to the opening of the supply line and open on a pre-set two- to five-degree F. wet-bulb temperature override. This reduces the steam consumption and allows for more accurate control than was possible with a dual-operating simultaneous-spray-opening vent-closing single system. The chart is revolved under the pens by a clock mechanism which may be electric or spring operated.

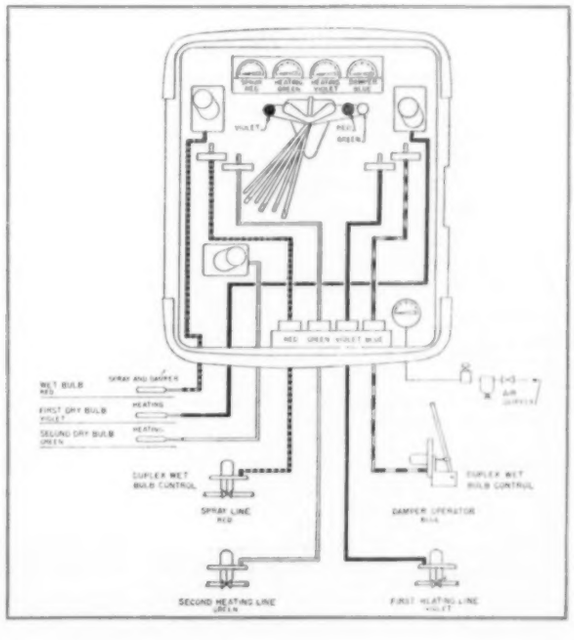
How to Install the Recorder-Controller

The wet-bulb (a bulb similar to the dry-bulb but covered with a wick which, in turn, hangs in a water box to keep it constantly wet) and the water box are installed in a location in the kiln where the humidity is representative of the conditions to be measured. The wet-bulb *must* be installed where there is sufficient air circulation, *i.e.*, 200-600 r.p.m. The water box should be installed so circulating air strikes the dry-bulb first.

For the best accuracy, the tem-



Diagrammatic sketch of the internal working elements and accessories of a single pen recorder-controller.



Diagrammatic sketch indicating the relationship of sensing to recording to controlling through matched color coding in a 3-pen instrument.

perature of the water supplied to the water box should be nearly the same temperature as the wet-bulb for proper evaporation from the wick. Water boxes used are usually continuous flow, where a constant flow of water runs to the box with a desired level maintained by an overflow valve. These boxes must be firmly attached to a substantial support, level both ways to insure proper water level without overflow.

The main criterion of dry-bulb installation always is to locate the bulb (s) in the hottest zone (s) of the kiln to prevent subnormal temperatures from being recorded. In finding the proper position for the bulb (s), a maximum-reading thermometer should be used to locate the hottest zone (s) on the entering-air side of the load, along the full length of the load. If the kiln is a cross-circulation one with reversing fans, then a dual dry-bulb system is recommended so that when the circulation is reversed, the bulb on the entering-air side will indicate on the recorder and the heat will be controlled on the basis of these readings. The bulb also must be located away from excessive heat or cold (steam coils or doors). The bulb should be at least 4"-36" away from the wall and high enough so that it is out of danger.

After the bulbs and the water box are installed, the capillary tubing is attached to the bulbs firmly to insure tight connections, and prevent injury from vibration. Tubing should not be bent in a radius of less than 3". If the tubing is clamped to the wall, care must be taken not to crush the tubing. In any other fastening situation, the tubing should be taped or wired firmly to a rigid support.

If vapor-pressure or liquid-filled instruments are used, the elevation of the bulbs must be within a foot above or below the level of the instrument case. Usually, the capillary tubing is filled with liquid that has condensed due to the fact that the ambient temperature of tubing is below the boiling point of the enclosed liquid. If the bulb is placed more than a foot above or below the elevation of the case, this head of liquid will affect appreciably the instrument calibration.

The instrument case location should be well lighted, and free from vibration or large temperature variations. The mounting support should be rigid with the case mounted level.

Control valves are installed on the steam lines to the heating coils and spray lines. These control valves should be reverse acting, so they will close the heat and spray lines in case of air supply failure and prevent injury to the load. For faster reaction in the kiln to the settings on the controller, it is advisable generally to install the valves as close as possible to the kilns, but they should not be installed where the temperature rises above 125° F.

The air control lines from the controller to the valves usually are ¼" i.p.s. (inside pipe size) brass piping or ⅜" o.d. (outside diameter) drawn copper tubing (corrosive conditions may require ¼" i.p.s. clean, black iron pipe). A strainer ahead of the control valve will increase valve life greatly.

A by-pass line should be installed around the control valve with hand valves on each side of the control valve and one in the by-pass line.

The control valve *must* be mounted with the stem in a vertical position and the motor head upright (unless offset valves are used). For operation, the steam

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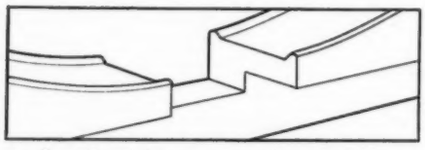
- **Cuts clean and sharp as a razor**
- **No splintered sides of veneered or solid stock**

Furnished with High Speed Steel Cutters, 4 spurs, 4 shear cut knives. Made with hub and self-centering sleeve (as shown) or with straight bore. Adjustable in width by spacers from 1-3/16" to 2-3/8"; 1-¼" to 2-½"; 1-½" to 3". Supplied with 12", 14" or 16" dia. cutting circle.

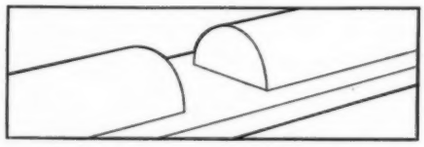
"Savings in every cut" — says one customer who had two men doing nothing but patching veneer before he put this Special VMT Adjustable Dado Head to work.

It's made to run on variety saw or tenon machine. Used to notch out, cut out for hinge seats and numerous other cuts. Absolutely will not splinter either side of veneered or solid stock.

Check with us right away for full facts and prices — remember there's "Nothing on the market like it!"



Smooth notch out cut made with VMT Dado Head with straight bore on variety saw.



Notch out cut made with VMT Dado Head on tenon machine. Spurs make sharp clean side cut as knives cut bottom.

Virginia **MACHINE TOOL CO.**

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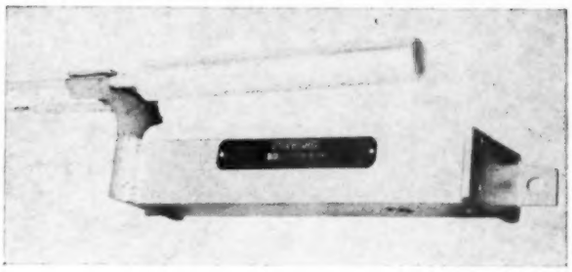

Typical dry-bulb and wet-bulb sensing elements. Note drill holes in base of water box for the water inlet and exhaust lines.

flow through the valve must be in the direction of the arrow on the valve body. If a single seat valve with a ground seat is used, any distortion caused by using the wrench on the far end of the valve will ruin the seat and cause leakage. The stuffing box nut generally is left only "hand-tight." If it is tightened further, valve stem friction may result. A slight leak often assures a freely operating valve.

Adequate Air Supply Necessary

It is wise to mention initially that the air supply should have a large storage tank—oversize if possible—so there will be a reserve of air in case of power failure. Any air-operated controller must have a supply of clean air, with prior planning to eliminate water, oil or dirt from the system. All tubing and fittings must be clean inside and burr free. Joint compound must be used sparingly and on male fittings only. It is highly advisable to check all joints under pressure with soap and water solutions to eliminate leakage.

A maximum of .50 cubic f.p.m. of free air must be supplied for each relay in each instrument, so the controller must have an air supply of 15 to 25 lbs. p.s.i. This pressure may be maintained in the header or by a regulator. A dryer should be attached to the line if it is exposed to freezing temperatures. A supply header serving a series of instruments should be sloped ¼" per foot of length *away* from the instrument leads. All sumps or drip legs should be blown out daily. Supply piping to the instruments may be taken off the top or side of the header, but never from the bottom. An air filter or filter dripwell should be installed in the air line immediately adjacent to the instrument, and the pet cock on the bottom should be opened daily to remove accumulated moisture.

Maintaining the Record-Controller System

Before any cleaning or minor adjustments are attempted, the kiln operator should consult the instruction manual furnished by the instrument manufacturer. These manuals are prepared carefully, giving step-by-step instruction of any repairs or adjustments that the kiln operator can make. In all cases, when the manufacturer recommends the action be undertaken by factory-trained personnel, the advise should be followed.

Spring-operated clocks are best cleaned by removing the mechanism from the case, winding it, and allowing it to unwind in a container of recommended solvent. This will dislodge most of the dirt present.

Due to the intricate nature of recorder-controllers, they easily go out of calibration. The following steps in calibration are the essentials recommended by most manufacturers.

1. Prepare a pail of hot water and provide an accurate thermometer of known calibration.
2. Remove the controller bulbs and about a foot of the capillary tube, immerse them in the pail along with the thermometer, and raise the temperature of the water bath to boiling, stirring constantly.
3. After the controller pens come to rest, note the temperature on the thermometer and that indicated on the recorder. These readings should agree.
4. Move the control indicators slowly past the pens—both above and below the indicated temperature. Note the temperature indicated by the pointers when air pressure starts to increase.
5. Repeat this procedure several times to check the controller over a wide range of temperatures.

The wet-bulb is calibrated in a like manner with the wick removed. Errors may be of two kinds—constant and cumulative. Constant errors are those which vary the same amount and in the same direction (plus or minus) through the whole range on the recorder. A constant error may be corrected by resetting the pen arm the required distance by means of a small set screw near the pen arm pivot. Cumulative errors are those which gradually increase or decrease over the temperature range. Adjustments are intricate for these errors, and should be done by a factory-trained engineer. Previous recommendations about maintaining a clean air supply should be reviewed, as dirty air supply causes the majority of recorder-controller maintenance problems.

Limitations of Recorder-Controller Systems

The majority of misoperations of dry kiln recorder-controllers arises from improper installation or improper operation of the units. Disregard for proper bulb location elevation, instruments out of calibration, or dead elements may give incorrect readings which, if the operator depends on them, may lead to prolonged drying time, incorrect changes, and even degraded lumber.

Kiln design and control equipment should be engineered together to produce the most effective operation. Defects introduced in air seasoning cannot be removed in the dry kiln nor can the automatic recorder-controller reduce the degrade effected by an operator pushed by an unrealistic production schedule or supervisor.

Thank You!

The following companies were instrumental in supplying information and photographs: The Foxboro Co., Foxboro, Mass.; The Taylor Instrument Co., Rochester, N. Y.; and Moore Dry Kiln Co., Jacksonville, Fla.

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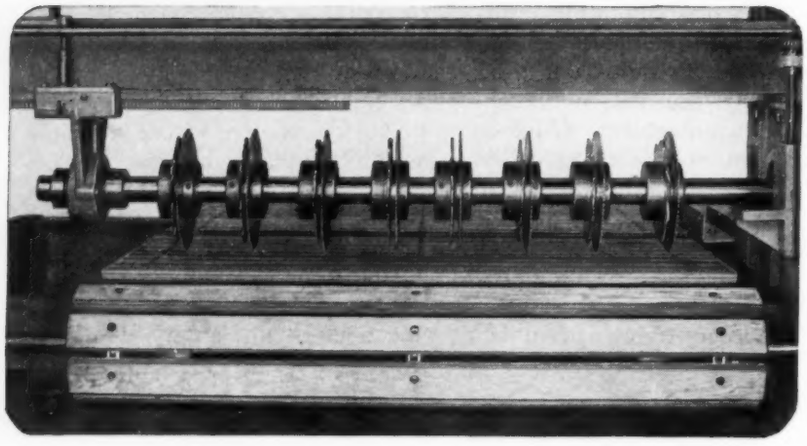
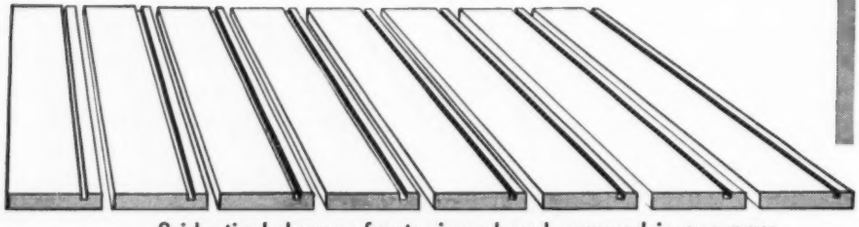


Arbor set-up for multiple drawer front work.



8 identical drawer fronts ripped and grooved in one pass.

THESE 4 are only a few of the uses for the versatile M-J No. 435-H Slat Bed Machine. Installations in furniture factories have proved that this machine will produce parts formerly manufactured on variety saws and by other hand operations. This machine is available in a wide variety of sizes and with practically any number of saws and groovers or saw and groover combinations. It's one of the most adaptable machines ever designed for use in a modern woodworking, plywood or furniture plant.

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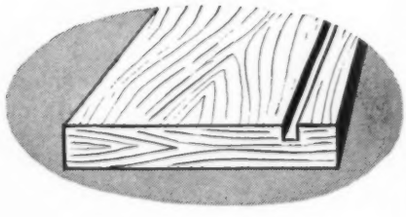

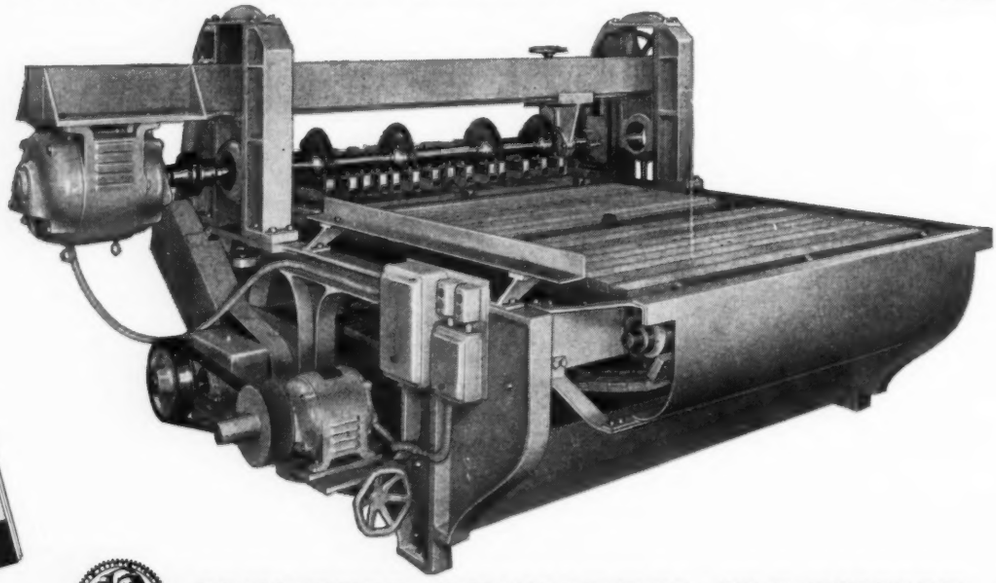

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PENCIL MAKING AT THE EBERHARD FABER PLANT

By George Toles

Techniques developed over more than 160 years of pencil-making are brought to a new peak of perfection in the $3,000,000 plant of Eberhard Faber Pencil Company at Wilkes-Barre, Pa., now approximately one year old.

The seven-acre, one-level plant stands on a 38 acre site atop a mountain. Bringing to bear their combined experience in every aspect of pencil-making and distribution, Eberhard Faber people sat in with architects, designers and engineers creating new devices and methods. The structure was designed to fit in with, and around, these operations.

One result is rapid handling of materials by conveyor systems, all on one floor—from packaging through shipping. Finished products flow through an inventory checking system using IBM equipment. Packages are segregated and, when needed, released to proper storage areas. By conveyors, orders are filled, addressed, tallied and placed on shipping platforms.

But how is a modern pencil made?

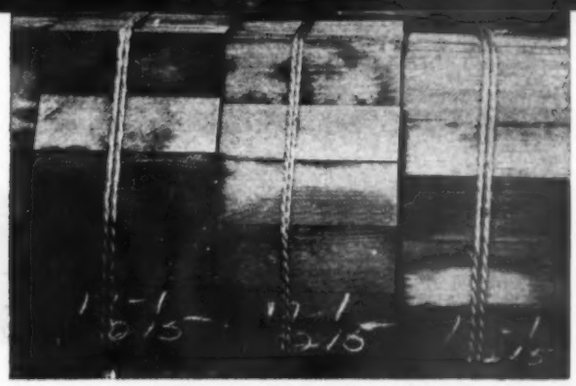
Essentially, the pencil is a sandwich—with a sliver of "lead" enclosed in two rounded slabs of wood.

Nothing sounds simpler to make, but actually the process involves over 125 technical steps and ingredients from 25 countries. It starts in the plant with the grinding of graphite from Madagascar, Ceylon and Mexico. This makes fine face powder seem coarse by comparison.

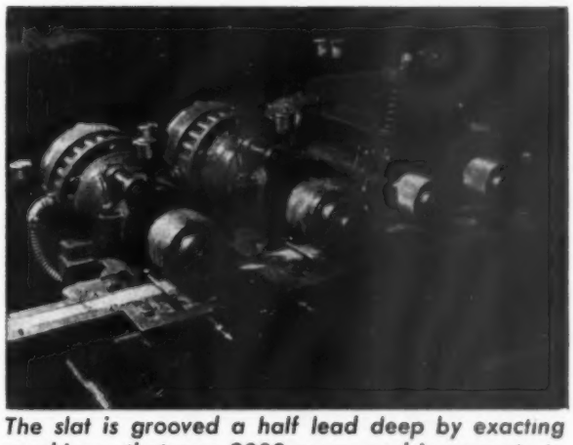
Meanwhile, Bavarian and domestic clays are mixed with water and the finest particles are removed. It becomes as pure as the clay in the finest china. Clay and graphite are then blended by precise formulae and mixed with water in giant machines. Each batch, according to the scientific formula results in a specific degree of lead in one of the most carefully controlled steps in the entire process.

Tremendous pressure then forces the graphite-clay mixture through diamond dies, resulting in spaghetti-like strands which, when later cut to size, begin to loom like pencil leads. The "spaghetti" is further dried and put in kiln-furnaces for firing at 2100° F. The leads vitrify like fine ceramics. When cool, they are hard and strong. For added writing ease, they are impregnated under vacuum pressure with various combinations and rare and costly waxes.

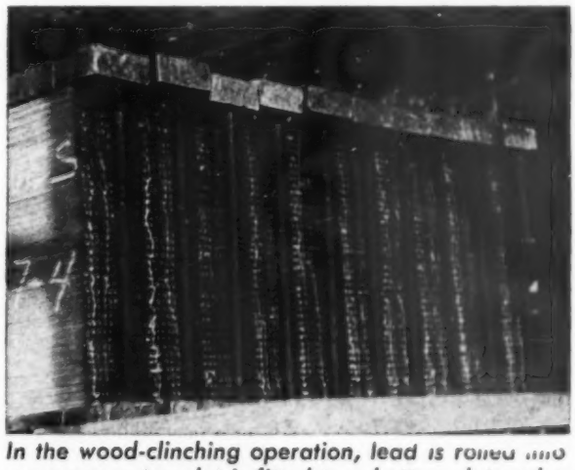
Now they are ready for their wood cases. Western incense-cedar of close, straight grain best holds the lead firmly, yet is soft enough for easy pencil sharpening. It arrives in slats, usually seven pencils wide, and is planed to half the thickness of a pencil. Grooves for the leads are then cut in the slats, and pencil-length are rolled in mechanically



Special wood for pencils is selected from western cedar. It is processed into slats and straight grained so the pencil can be easily sharpened.



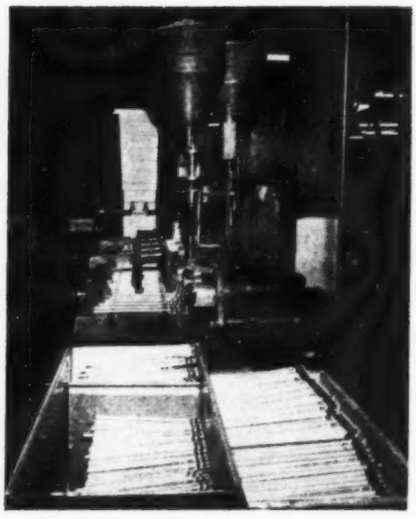
The slat is grooved a half lead deep by exacting machinery that runs 9000 r.p.m. and is accurate to 1/1000". Only half of the pencil comes from one slat.



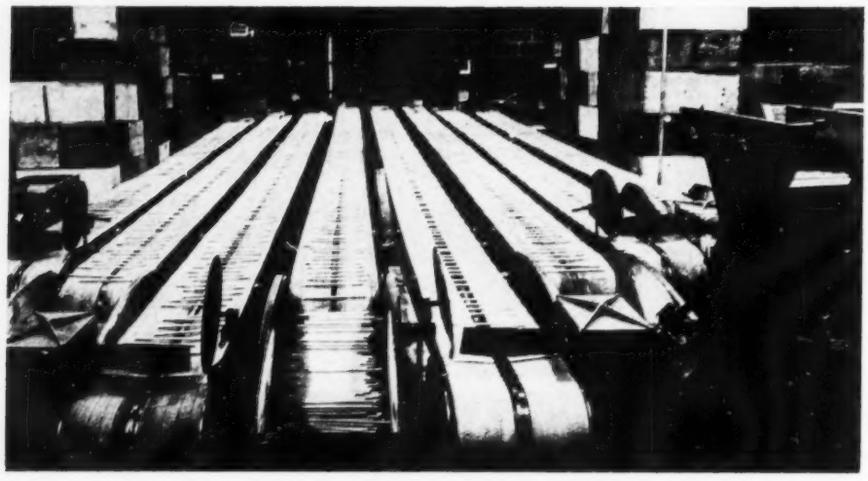
In the wood-clinching operation, lead is rolled into a groove, a top slat is fitted to a bottom slat and a special glue binds the slats together. Then, under controlled hydraulic pressure, the two sides are permanently bonded with no trace of where one meets the other.

Below: Pencil sandwiches are fed end to end into an S. A. Woods molding machine. One rotating cutter head shapes the top half of the pencil sandwich. The next rotating cutter head shapes the bottom half, and the individual pencils merge.

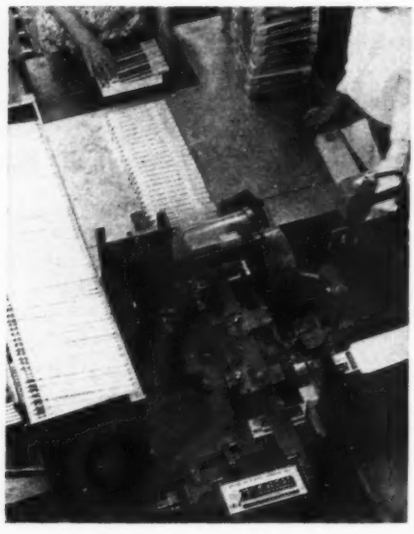
Wood takes on a satiny smoothness through high speed sanding with progressively finer grits. Each panel of the hexagonal shape receives individual attention in the process.



On this 5-station Oglesby tipping machine the shoulder is cut; pencil receives a metal ferrule, which is clinched into the wood; the eraser is inserted and is retained by another clinching through another side of the ferrule; and the eraser gets a bath.

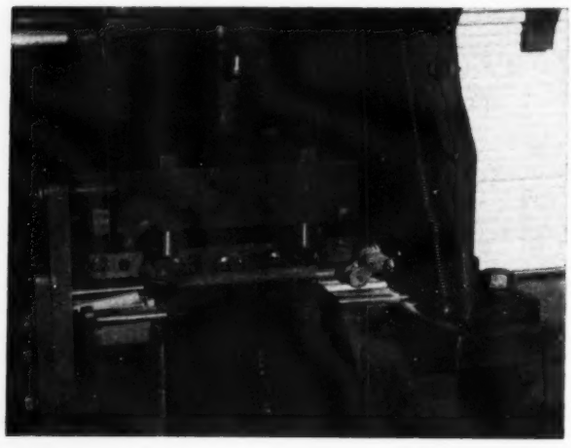


The pencil then goes through a unique varnishing operation in which it receives up to 13 coats. Each coat dries before the pencil reaches the next coating step.



Pencils are packaged in a box of 12 which is filled and closed in a matter of seconds.

A specially coated India leaf imprints the brand name on the pencil with a heated die. Close-up shows pencils moving through stamping machine.



Trained inspectors examine the production line for flaws.

An identical grooved slat, glued on the underside, is next placed on the one holding the leads, to make the sandwich. Hydraulic pressure clamps them together in a permanent bond, hence the expression, "wood-clenched" pencil. The unified slat is cut into pencils.

After shaping and sanding, each pencil then gets up to 13 coats of finish, and the brand name is applied with a leaf stamp. A shoulder is cut on the end, a metal ferrule is clutched to it, and the eraser is inserted. The pencils are packaged and shipped to every corner of the globe.

Dust collecting is important in the new plant, for wood-cutting and sanding operations create six tons of sawdust daily. Huge blowers keep the air dust-free and even ceiling materials have been chosen for non-adherence of dust. Air in the entire plant is changed every three minutes.

Special ventilating equipment in the varnish area pulls fumes down through underfoot openings while fresh air replaces it from above. However, in cold weather, about 50% of the cleansed air is returned, to preserve its heat.

Electrical power is centered at three points of greatest need—the woodworking, lead processing and metal areas. To guard against sparks, the varnish area has unique lighting, telephones and other equipment.

Ample elbow room allows plenty of production space for workers in safety and comfort. An entirely new kind of industrial waste disposal system segregates aniline colors, detergents and accumulated solids.

Easier and less costly to clean is the over-all roof with its foundation of corrugated, galvanized steel. The plant's interior emphasizes not only working comfort but easy housekeeping. Natural light is fully utilized and blended with latest types of recessed fluorescent lights.

The pencil theme has been ingeniously carried out in wood paneling of Western cedar—used in pencils—in executive offices and reception rooms.

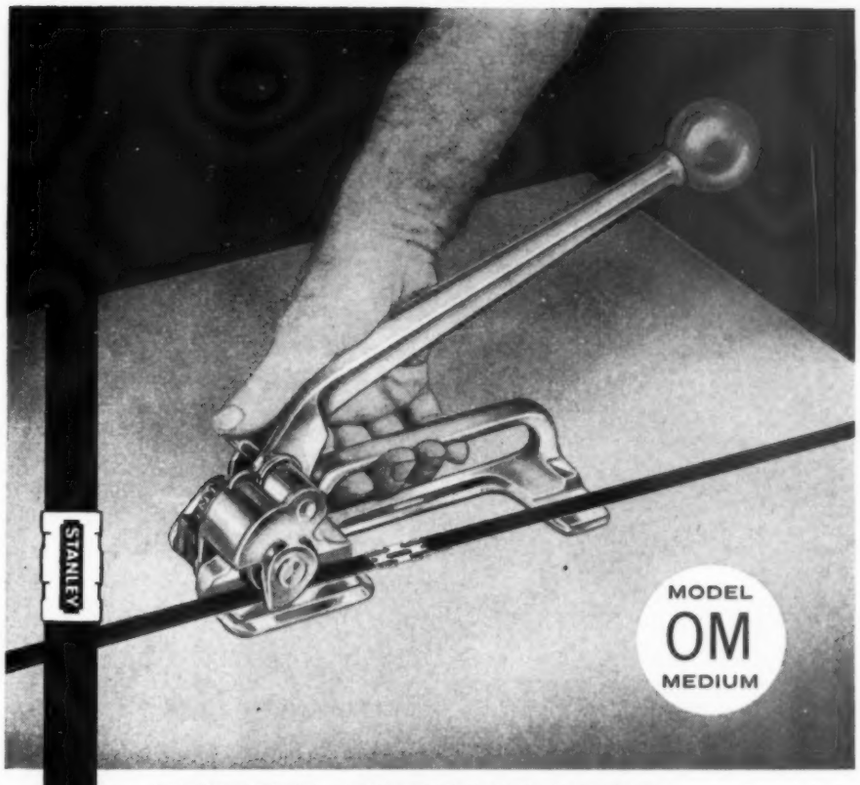
Delta Offers New Lamp

A new one-page, photo-illustrated bulletin describing the Delta lamp attachment is available from Rockwell Manufacturing Company.

The heavy-duty lamp, ideal for intricate jobs requiring a strong, close-up light, can be used on radial saws, drill presses, shapers, lathes and other industrial tools. Five photographs illustrate how the attachment can be used with various tools. The bulletin also includes specifications.

For a copy of this bulletin (AD 1155) write Rockwell Manufacturing Company, Delta Power Tool Division, 499 North Lexington Avenue, Pittsburgh 8, Pa.

Use postpaid card. Circle No. 4



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- **Seals applied in front or behind tensioning wheel.**

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	OL 5		5/8"
MODEL	OM 5	MEDIUM DUTY	5/8" STRAP
	OM 6		3/4"

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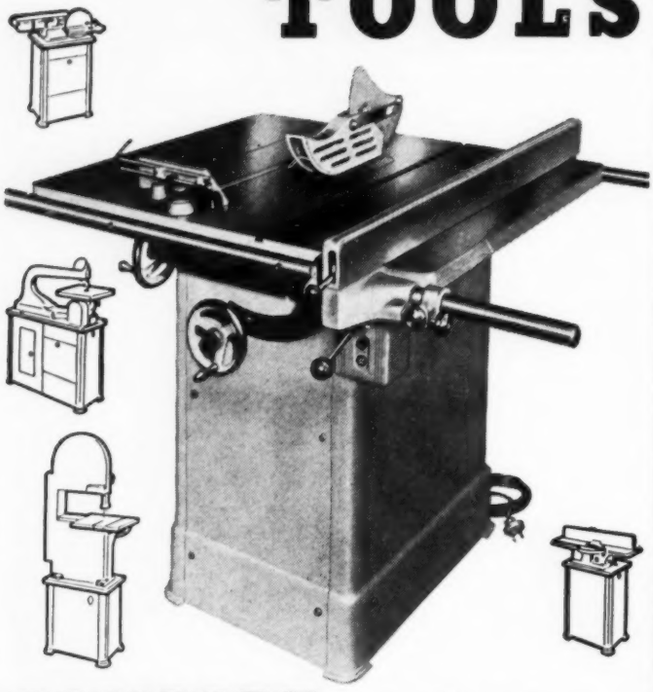

COMPARE and see...

Specifications	Duro	Brand "A"	Brand "B"
Table Size with Ext.	33"x38"	27½"x35"	32½"x50½"
Arbor Diameter	⅝"	¾"	⅝"
Depth Cut 90°	3¼"	3⅛"	3⅛"
Depth Cut 45°	2-7/16"	2⅛"	2⅛
Maximum Distance Blade Fence	25½"	25"	25"
Distance Ahead Blade	14¾"	12½"	13"
Number Belts	3	2	3
Mitre Gauge Control	Yes	Yes	No
Price	$325.00	$335.00	$334.50

The chart above gives a quick, capsule picture of Duro's circular saw superiority when compared with 2 nationally advertised models. This superiority is equally evident when the **entire** Duro line of power tools is compared with **any** of the leading makes. Duro Tools offer an exclusive "built-in" rigidity, a lifetime ruggedness, "years ahead" design, unique safety features and precision accuracy that's unduplicated! If you're searching for finest quality, outstanding performance AND PRICE—Duro is your best bet.

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2663 N. Kildare Ave. Chicago 39, Ill.

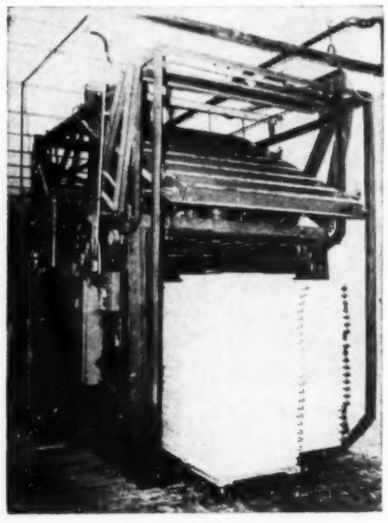
Bright Future For Wood Windows and Sash

▼ "After more than 20 years' experience in preservative treating (of wood) the stock millwork industry *has not found an authenticated instance of decay in* woodwork treated in accordance with National Woodwork Manufacturers Association standards."

That statement in a recent bulletin of the millwork industry pointed back to what now looks more and more like a milestone in the industry's history, the beginning of a distinctive period in quality control. It brought a feeling of pride to the Western Pine lumber industry, whose research laboratory in 1935-36 laid the foundation for today's millwork standards.

It was on an autumn day 22 years ago that the Western Pine Association's research lab in Portland unveiled its Permatol formulas for preservative treating of stock millwork. For more than a year the lab had pursued a project to pinpoint causes of decay, test various preservatives and prove out the most effective, clear, paintable treatment for fine millwork.

A then little known chemical called pentachlorophenol was found most promising among some 25 preservative compounds tested. The Western Pine Association chose the name "Permatol" for it and re-



A batch of ponderosa pine frames being wheeled into chamber for pressure treating with Permatol (pentachlorophenol).

For Safety Sake.

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Ball Bearing & Lock Edge

Eliminate friction caused by old style collars, prevent burning of patterns, insure absolute protection against knives flying out. Lock edge collars have screw adjustment enabling operator to set knives to thousandth part of inch.

WOODWORKERS' TOOL WORKS

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The late Dr. E. E. Hubert at work in the Western Pine research laboratory where he brought out the Permatol wood preservative formulas in 1936.

leased it to the trade unfettered by patent restrictions. It became the basis for standards established by N.W.M.A. which had collaborated with Western Pine in the research job. N.W.M.A. set up its "Seal of Approval" program for stock treated in accordance with published standards.

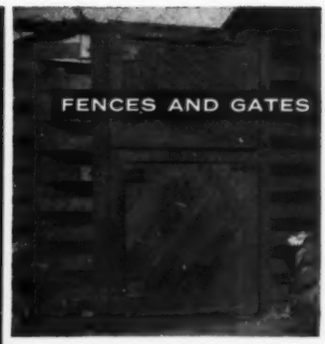
As far as known, not a single window in the United States was penta-treated prior to 1935. Today more than 100,000,000 windows in homes and other buildings are protected with it, and about 11,000,000 more are installed each year, all with the promise of long life as indicated in the millwork industry's bulletin mentioned previously.

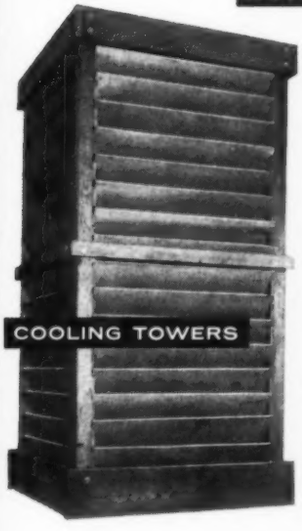
Up to 1936, penta was an uncommon substance found chiefly in laboratories. Today three U.S. chemical companies manufacture between 12,000,000 and 15,000,000 lbs. of the material in crystal form. For treating millwork it is dissolved in a clear oil that carries it into the wood without discoloration.

To extend the protective standards still further, the N.W.M.A. and lumber manufacturing industries are in the process of perfecting a double-barreled treating process which repels moisture while inhibiting decay—all in one solution, one treatment. Seven promising water repellents are under study, and satisfactory results are being tabulated. An advisory subcommittee to the N.W.M.A.'s Preservatives Standards Committee is riding herd on the project.

Western Pine pitched into these research projects because of close ties with the millwork industry. More than half of all millwork produced in the United States is of ponderosa pine lumber from the 12-state Western Pine region.

"Reports from our field men indicate that wood windows and sash are in a strong and growing upswing," said Joe Sherar, promotion director for the Western Pine Association. "I'm sure we can give much credit for this to the long-life standards that were established for millwork. With each passing year now it's getting easier to show remarkable performance of wood windows made possible by the standards that were adopted 20 years ago. It surely looks like a bright future for wood in this vital phase of the building industry."





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Proper Blade Selection Reduces Particle Board Costs, Ups Quality

Joint Tests by Radial Cutter and Weyerhaeuser Prove
Money-Saving Advantages of Using the Right Blade

By George Mackrin
Radial Cutter Mfg. Co.

▼ Some of the problems involved in machining particle board have been overlooked by a number of firms using or manufacturing these materials. To date, many producers have been concerned only with the end product. Little thought has been given to the cutting problems that are inherent in particle board: problems like tear out, abrasive action, and pile up on the cutting edge—all due to the resins and glues used in the construction of particle board.

In an attempt to demonstrate that such cutting problems can be solved the Radial Cutter Mfg. Corporation of Elizabeth, New Jersey, wrote to the Weyerhaeuser Sales Company, a leading producer of particle board, offering to assist in solving any cutting problems their customers might be encountering. Radial cutter had already performed this service for Rohm and Haas, General Electric, Formica and other such firms as part of a general program aimed at solving industry-wide cutting problems.

The Special Products Division of Weyerhaeuser sent samples of various materials, including their particle board. These were all 4' square and in various commercial thicknesses. The samples were tested in Radial Cutter's testing laboratory and the right blade to cut each type of board was established through repeated, accurate and closely controlled tests. To verify their results, Radial Cutter submitted to Weyerhaeuser's testing laboratory, all the wood samples from the tests along with a complete report. Weyerhaeuser concurred with the results obtained by Radial Cutter.

Radial Cutter then published the results of the tests in a technical bulletin which Weyerhaeuser now uses for their salesmen, customers and prospects. This technical bulletin contained not only information on the proper blade for the proper machine for the proper thickness of material, but additional statistics on operating speeds, blade performance, care of blade, blade mounting procedures, etc.

Inasmuch as this article is concerned with particle board only, we will devote ourselves to that phase of the tests. The chart that follows has been modified to fit almost all types of particle boards rather than the two densities tested for Weyerhaeuser (40 p.c.f. and 30 p.c.f.). We have also extended the figures to greater thicknesses of board than were submitted by Weyerhaeuser (¾" to 1"). These modifications and additions were verified through extensive field experience.

The testing laboratory of Radial Cutter consists of small and large table saws, small and large radial saws and a panel saw. The laboratory, including all the engineering work and preparations of recommendations, is under the direction of Mr. Lucien Revol.

The material was cut, in turn, on each machine, using different blades. Each blade had a different face rake, pitch, grind, etc. The samples as they were cut, were marked for future identification. Then the samples were examined to determine the quality of the cut. From these results, a chart was prepared. As far as the following chart is concerned, we eliminated one of the carbide tip designs to take into consideration the blade life. This information was gathered through a record of the blade applications in the field.

In order to better understand the charts it is necessary to explain a few terms. Kerf, according to the dictionary, is the slit made in cutting, as by a saw. The kerf referred to are as follows:

Code	Kerf thickness (in decimal parts of an inch)
B	.110
C	.135
D	.165

The minimum total clearance of the carbide to the blade shank should be approximately .030. Incidently, Radial Cutter used a nickel-chrome alloy steel which is ground and polished to a microfinish of less than 10. This helps prevent the glue deposits from collecting on the shank of the blade. This type of steel also has a high heat co-efficient to help absorb the heat resulting from friction when the glue deposits on the blade rub against the cut material. The carbide tip design commonly referred to as "triple chip" consists of one double chamfered tooth followed by one square tooth that is not on the same radius. The bevels must be accurate. An inbalance would cause the blade to lean to whichever side had the greater bevel. The front angle or

A strip of particle board being visually checked. On the table are additional samples from another manufacturer awaiting cutting tests. They are particle board and also plywood sheets laminated with a plastic veneer both top and bottom.

the cutting angle made by the carbide tooth to the center line of the blade is, in all cases, 15°. These tables are to be used for table saws, panel saws, radial saws, all of which are either hand fed or power fed. The cutting speeds should be 3000 to 3500 r.p.m. for a surface speed of 6500 to 13000 s.f.m., according to blade diameters.

I. Good Commercial Finish Cuts.

A. Material Stacked to a Total Thickness of 2" to 2¼".

Diameter	Teeth	Kerf
10	24	D
12	24	D
	30	D
14	30	D
	36	D
16	30	D
	36	D
18	36	D

B. Material Single Sheet or Stacked to 1—1 ¼" Thick.

Diameter	Teeth	Kerf
8	30	C-D
	36	C-D
10	30	C-D
	36	C-D
12	36	C-D
	40	C-D
14	40	C-D
	54	C-D
16	40	C-D
	54	C-D

C. Material Single Sheet Under ¾" Thick.

Diameter	Teeth	Kerf
6	30	C
8	36	C
10	48	C
12	54	C
14	60	C
16	72	C

II. Very Smooth Cuts.

A. Material Thickness ¾" to 1-¼" Thick.

Diameter	Teeth	Kerf
8	40	C
	48	C
10	48	C
	60	C
12	54	C
	60	C
14	60	C
	72	C
16	72	C
	80	C

B. Material Thickness ¾" ½" ⅜"

Diameter	Teeth	Kerf*
6	40	C-B*
8	60	C-B*
10	72	C-B*
12	72	C-B*
	80	C-B*
14	80	C-B*
16	80	C-B*
	96	C-B*

*B Kerf is restricted to parts not over 3' x 3' except where it is being cut on radial saw or panel saw.

Operator making sample cuts for a large manufacturer of particle board. Test is being conducted in Radial Cutter's laboratory.

III. Particle Board with Decorative Plastic Laminates

Diameter	Teeth	Kerf	Remarks*
8	48	C	Material ½ to 1"
10	60	C	Material ½ to 1"
12	60	C	Material up to 1-¼
	72	C	¼ to ¾
14	60	C	Material up to 1-¼
	72	C	⅜ to ¾
16	60	C	Material up to 1-½
	72	C	⅜ to 1"
18	60	C	Material up to 2"
	72	C	½ to 1"

*The teeth on all diameters of blades other than those indicated for the thickness of material shown would have to be interpolated.

IV. Particle Board Laminated with Wood Veneers

To trim particle board laminated with wood veneers, we suggest the same blades as are given in Table III, except for certain applications on brittle veneers like Philippine mahogany, oak, etc. For these woods we suggest a special design of carbide tip to avoid chipping.

Of course, there are some exceptions to the above charts. One that comes to mind readily is a trim operation where the offal or fall of the piece is not used. In this instance, a special trim blade is used.

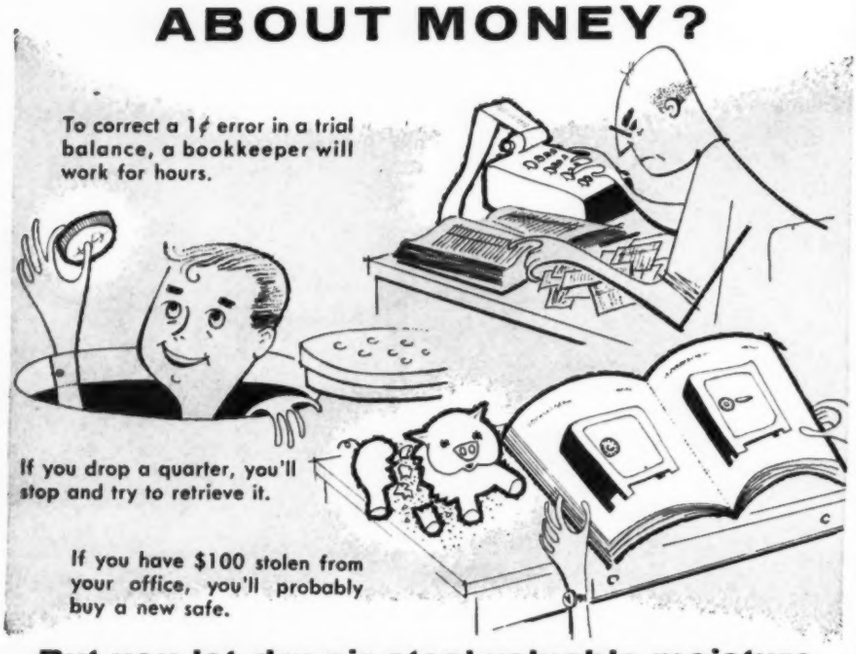
The charts take care of almost all saw cutting on almost all machines. The machines must be in good operating condition; the blade should be properly lined up. The blades should not be used beyond the dull stage. When the blades collect too much glue deposit and are still sharp, it is easy to remove the deposit by immersing the blade in a solution of one pound of trisodium phosphate to two gallons of water.

Particle board lends itself to other operations, too, such as grooving, routing, bevels, etc., with well-made carbide-tipped tools.

The most important results of these Radial Cutter-Weyerhauser tests is the fact that they definitely established the importance of proper blade selection in the overall problem of cutting particle board. In the ever-increasing pinch between rising production costs and narrowing profits, every penny saved grows more important. By scientifically evaluating the material you are cutting and then selecting the right blades, the right machine, speed, etc., it is not only possible to achieve an infinitely better cut, but that better cut will cost less. Give blade selection all the attention you give any other aspect of your production line and it will reward you handsomely.

Isn't It Funny—

ABOUT MONEY?


To correct a 1¢ error in a trial balance, a bookkeeper will work for hours.
If you drop a quarter, you'll stop and try to retrieve it.
If you have $100 stolen from your office, you'll probably buy a new safe.

But you let dry air steal valuable moisture without doing a thing!

It's human nature—we're all funny about money. When it's obvious we're losing it, we act. But when it's not so obvious, we rarely bother to investigate.

You probably realize that dry air costs you money—but you may not realize how much, because the losses are not always obvious: warping and checking in storage . . . splitting during production . . . gluing failures . . . poor finishes . . . and more.

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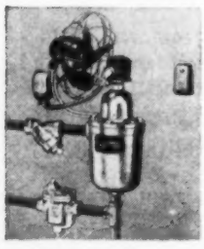

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Book Explains Operation of Woodworking Machinery

A revised edition of Herman Hiorth's "Operation of Common Woodworking Machine," a standard for beginning and advanced woodworkers for the past 16 years, has been announced by the Bruce Publishing Company. The 12th edition of this book bars the title: "Operation of Modern Woodworking Machines." William F. Holtrop, associate professor of Industrial Arts at the University of California, Santa Barbara College did the revision, a 176 page book.

The book describes and illustrates the correct techniques for safe use of woodworking machines. The descriptions show the user how the different parts of each machine are interrelated, how they can be set and adjusted to perform certain operations and how jigs and accessories can be fashioned and used on the machines for special tasks.

Since 1942 the original book has been widely used all over the United States. Mr. Hjorth was a nationally recognized expert in woodworking and before his death in 1951 he had written six books.

The new edition offers up-to-date illustrations and pertinent facts about modern machines that have come into use since 1942. Rearrangement and regrouping of special topics make the text far more usable. A special chapter is devoted to the multi-purpose machine.

The book is available in both cloth and paper editions from the Bruce Publishing Company, 400 North Broadway, Milwaukee 1, Wis.

How Important Are Guards on Woodworking Machines?

Guards for woodworking machinery have been given much attention from early days because woodworking machines operate at notably high speed, and have been responsible for many accidents. Under these circumstances, it is only logical that underwriters should exert all possible pressure for legislation which will require certain types of guards in specified locations. Quite naturally, the greatest amount of pressure has been exerted toward guarding those machines which statistics show are responsible for the largest number of severe accidents.

Most of the serious accidents in woodworking occur from operators getting their hands in contact with saws, or knives on revolving cutterheads. Therefore, particular study and effort has been made in the direction of guarding the actual point of operation. Some machines are almost never responsible for an accident. This, taken together with the fact that they are exceedingly difficult to guard, has caused them to be given far less attention.

An example is the boring machine. No attempt at all is made to guard this unit on the average operation. In an occasional instance, however, where a boring bit of large diameter is in use, of a type which has a high danger potential if the hand of the operator should come in contact with it inadvertently, a special type of telescoping guard has been applied. This guard surrounds the bit, but collapses and retreats in an axial direction as the bit enters the work.

Machine Manufacturers Often Include Guards

Many woodworking machines on which guarding of saws or knives assumes importance, have guards applied by the machine manufacturer. One practically never finds a swinging or straightline type of cutoff saw that is not already provided with a guard for that portion of the blade which does not come into contact with the work.

As a general rule, too, the manufacturer of a hand feed jointer will provide it with some type of guard, to cover that portion of the cutterhead which is revealed in front of the fence, while not in use. Many of these guards are so designed that they retreat to the left, in a line parallel with the axis of the cutterhead, as pressure of material being jointed comes against them. Usually, they have this retreating action against the resistance of a spring or of a pendant weight. Therefore, they maintain a position close against the side of material being jointed, thereby *keeping* that portion of the cutterhead not actually in use covered at all times.

Now and then, where rabbeting is being performed at a jointer, it becomes necessary to remove the guard while that particular operation is in process. Many times, where rabbeting work is performed intermittently with edge jointing, operators have been guilty of leaving the guard off the machine until they were forced to return it to place by the foreman, or possibly by an inspector. It cannot be denied that a certain amount of production time is saved in this way. The more often the rabbeting operation occurs, the greater is the time saving by leaving the guard off the machine. However, such time is saved at the cost of additional hazard and is very poor practice.

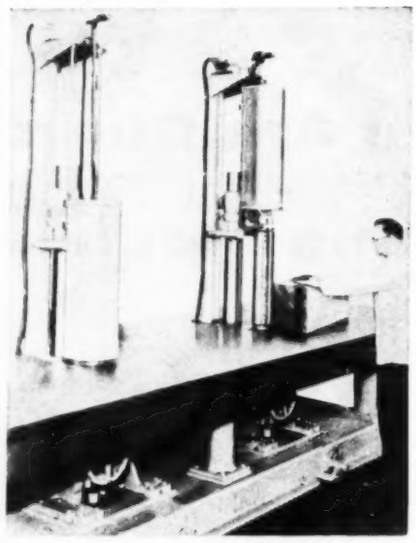
Variety Saw Guards

Somewhat the same situation arises at the variety saw table. This machine is usually provided with a guard over the top of the circular blade. In addition to protecting the hands of the operator, such a guard insures against the kick-back. Here, again, it is necessary to remove the guard from time to time when special rabbeting operations or dadoing work is being performed. There is a constant temptation to leave the guard off the machine. The more convenient a guard can be made in reference to easy removal and simple replacement, the more likely an operator is to cooperate fully in keeping it in place as much as possible.

Mattison over-cutting straight - edging ripsaw, Halleck & Howard Lumber Co., Denver, Colorado. The saw blade, along with the feed rolls, is contained within the roll housing, the blade itself being in registration with the nameplate. Thus, it is completely enclosed. The grille-type guard (left) covers the outfeed end of the feed chain.

Cutters on various woodworking machines are completely enclosed in operation, so it is not necessary to give any particular attention to guarding. This is true at the molder, for instance, where dust hoods connecting with the blower system cover the cutterheads, making it practically impossible for anyone to inadvertently get into contact with them. At the molder, the hands of an operator never come anywhere near the cutters while machining is in process.

In some cases, however, specific machines must be carefully designed to guard against injury. An instance in point is modern stroke sanders, like those made by Mattison, on which the lower strand of the running abrasive belt does the actual sanding, but the upper strand of the belt is in a position where a man could easily contact it with his hands, were it not properly guarded. For this and other reasons, the abrasive belt is completely enclosed at the top.



Interesting view of Greenlee shaper designed for use in experimental automotive body design shops. It has a table 5' wide and 15' long. The motor-operated guard on the left spindle is seen in its normal protective position. The one at the right has been raised to its full height, for illustrative purposes. In actual operation, however, it is raised only high enough to freely admit the particular thickness of the work being handled.

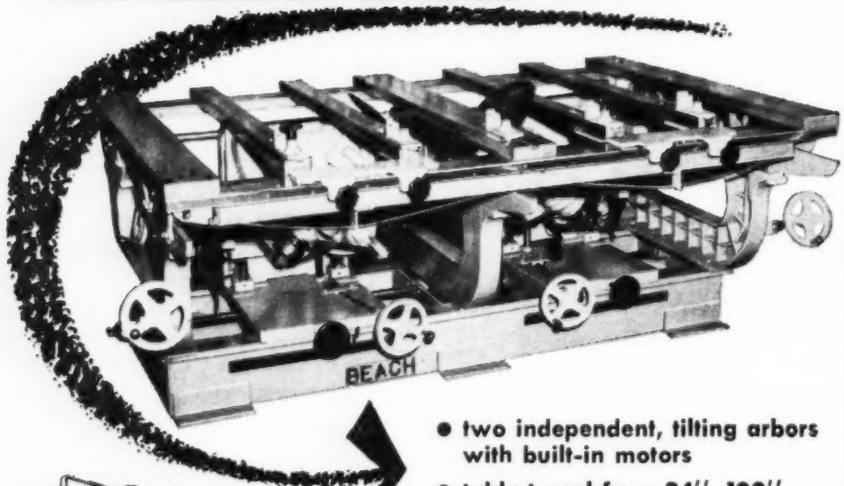
Ripsaw and Shaper Guarding

Possibly no other machines in the woodworking plant have so many accidents chalked up against them as the ripsaw and the shaper. Ripsaws of hand-feed type have always presented a dual hazard. It is easy for an operator to get his hand in contact with the running saw; also, many kick-backs occur, resulting in serious injury. Growing use of straight-edging ripsaws has greatly reduced the accident toll, particularly where green help is concerned because they are almost fool-proof. Lumber being ripped on such machines is closely confined between a pressure unit and a moving feed chain in the table of the machine, the saw blade itself being fully enclosed.

Some modern over-cutting units are provided with a set of narrow steel guard fingers, which normally hold a position down against the feed chain, but which lift under forward thrust of the stock, just enough to let it pass. Just as soon as the last end of material passes from beneath these fingers, they drop down again, protecting against any possible kick-back of slivers or debris. Moreover, these machines are equipped with a grilled metal guard extending out over the outfeed end of the feed chain. Therefore the offbearer cannot come in contact with the chain in the rear table. All moving parts of the

SPECIFY

BEACH DOUBLE CUT-OFF SAW



- two independent, tilting arbors with built-in motors
- table travel from 24''-100''

TILTING TABLE SAW

Where high precision woodworking operations are necessary, specify BEACH DOUBLE CUT-OFF SAWS. Tilting arbors make it possible to: 1) cut 2 mitres, 2) cut square at one end and mitre the other, 3) square both ends in one operation, 4) cut a compound mitre with 1 saw.

CARRIAGE mounted on ANTI-FRICTION ROLLERS for greatest accuracy of movement

END ROLLS and tracks have flat surfaces

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ARBORS are independent units with ball-bearing, 5 H.P. motor mounted on mandrel. Each arbor tilts to 45° with 6'' independent vertical adjustment

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BEACH MANUFACTURING CO. MONTROSE, PA.

machine, in fact, are completely guarded.

It is not easy to keep a woodworking shaper completely guarded. Much depends on ingenuity of the operator; his appreciation of the danger, and willingness to proceed carefully. Generally, a stock hold-down is designed so as to provide a guarding function. Various types of straight stock are run against a fence, which allows only a small portion of the shaper cutters to be exposed.

A most interesting type of guard, however, has been applied on heavy-duty shapers made by Greenlee Bros. & Company. Among various heavy-duty models produced, this firm has developed a double-spindle shaper for use in turning out mock-up model parts in experimental body design shops. Large and irregularly-shaped pieces of work are readily handled.

In the interest of operator safety, a special sheet metal guard was designed for each spindle. A motor drive raises this guard in accordance with the height of work being cut. When shaping is not actually in process, this guard returns to and remains in a position where it completely surrounds the cutterhead. Other safety devices are also incorporated in the machine.

Photographs in this article through the courtesy of Mattison Machine Works and Greenlee Brothers & Co., Rockford, Illinois.

Available Literature

New Wire Stitching Catalog Covers Many Operations

A new catalog on wire stitching has just been prepared by Acme Steel Company, Chicago, Illinois. The 28-page book describes the flat and accurate methods of wire stitching, typical stitching operations and gives details and specifications on over 30 stitching machines.

Typical applications are shown on all types of box stitching, bagging, carding, labeling, book stitching and metal stitching. These applications include simultaneously stitching tops and bottoms of filled cartons of rubber base boards, assembling fibreboard boxes for packaging, bagging and labeling toys, carding small hardware items, and joining coil springs to wood frames in furniture manufacture.

Copies may be obtained from Acme Steel Company, 135th Street & Perry Avenue, Chicago 27, Illinois.

Use postpaid card. Circle No. 7

Data on Grades and Specifications

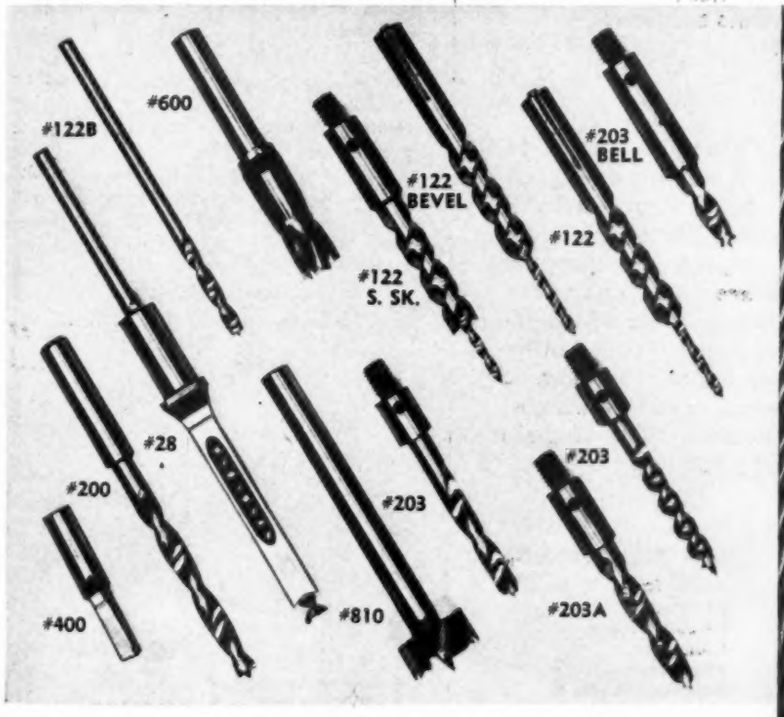
The West Coast Lumbermen's Association has published a new booklet, "Data on Grades and Specifications." This booklet was designed to provide useful information to the users and prospective users of West Coast lumber and contains information on the grades and specifications for Douglas fir, West Coast hemlock, Western red cedar, Sitka spruce and White fir. Descriptions of lumber grades, conversion tables, how to specify, and grade stamp information are all contained in this 16-page publication.

Copies of the booklet are available from the West Coast Lumbermen's Association, 1410 S.W. Morrison Street, Portland 5, Oregon.

Use postpaid card. Circle No. 8

Bulletin Describes Veneer Splicer

A new bulletin giving full details and specifications on the Diehl No. 900



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electronic tapeless veneer splicer has just been issued by the G. M. Diehl Machine Works, Inc.

The No. 900 splicer is designed for fast edge joining of veneers and core stock, and is especially suited to banding particle board and chip board cores. With wet urea glue applied by rollers to framing strip, the unit performs this banding work at feed rates of 35 to 40 f.pm. "Shorts" created in cutting up chip core panels can also be spliced on the No. 900, permitting full use of small scrap.

Glue is set by high frequency energy passing through an electrode mounted in the upper heater bar. Since the energy attacks only a single glue line, there is no danger of overloading the generator. A lower heater bar uses calrods to flake off any glue adhering to heater strips, Curing action is speeded by the tremendous side pressure developed through converging chains.

Powered by a 1½ h.p. motor, the Diehl No. 900 handles stock ⅛" to 1" thick at a speed of 15 to 85 f.p.m. Further details are available in the No. 900 bulletin. For copies, write the G. M. Diehl Machine Works, Inc., Wabash, Ind.

Use postpaid card. Circle No. 9

November 1958 Red Book Off the Press

The November 1958 issue of the "Lumbermen's Red Book" is now available. It is the 154th issue of the famous credit and sales guide.

Since 1876, the RED BOOK has been the principal source of credit information for the lumber, woodworking and allied industries of the United States. It lists—and evaluates—the manufacturers, wholesalers, retailers and quantity users of lumber and wood products of all kinds. The listings include credit ratings, business classifications, addresses and other facts of value to buyers and sellers alike.

The "Red Book" is published semi-annually and is kept up to date by supplements that go out every Tuesday and Friday throughout the year.

The "Red Book" agency also compiles detailed analytical credit reports, and conducts a collection service for the handling of commercial claims.

It is published by the Lumbermen's Credit Association, Inc. Its headquarters are located at 608 South Dearborn St., Chicago 5, Ill., and an Eastern Branch is maintained at 99 Wall St., New York 5, N.Y. Inquiries to either office will receive prompt attention.

Use postpaid card. Circle No. 10

Advantages of Nailing Industry

Automatic nailing machinery, its uses and advantages, is the subject of a new, factual, eight-page, full-color brochure recently made available by the Food Machinery and Chemical Corporation, Packing Equipment Division, Riverside, California.

Describing in detail the FMC line of nailing equipment, this informative, well illustrated bulletin covers the proper application of automatic nailing machinery to many types of production; fully explains the theory and operation of heavy duty and standard types of nailers. Also included are machinery specifications and dimensions, construction details, accessory equipment and typical installations. Features such as hydraulic drive, electric nail selection, monitored nail feed and custom jigs and tables are explained in detail. Actual case histories of nailing machinery applications are cited, including successful automatic nailing of hardwoods.

Copies of the bulletin may be obtained by writing the manufacturer: Food Machinery and Chemical Corporation, Packing Equipment Division, Riverside, California.

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NORTHFIELD
Single Chain Saw
MORTISER

FOR MINIMUM OPERATOR FATIGUE

FOR LONGER CUTTING EQUIPMENT LIFE

THIS MACHINE is soundly designed for peak production, long life and minimum expense. The hydraulic feed assures maximum number of mortises per hour with minimum operator fatigue. Other features include; automatic safety stop, automatic clamps; and automatic oiling of chain saw and guide bar.

The NORTHFIELD Guarantee

We guarantee perfect satisfaction to anyone who may purchase our machines, and if any reasonable exceptions are taken to their good performance, they may be returned at our expense.

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"When we installed the boxes, we never figured that they would also separate the men from the boys."

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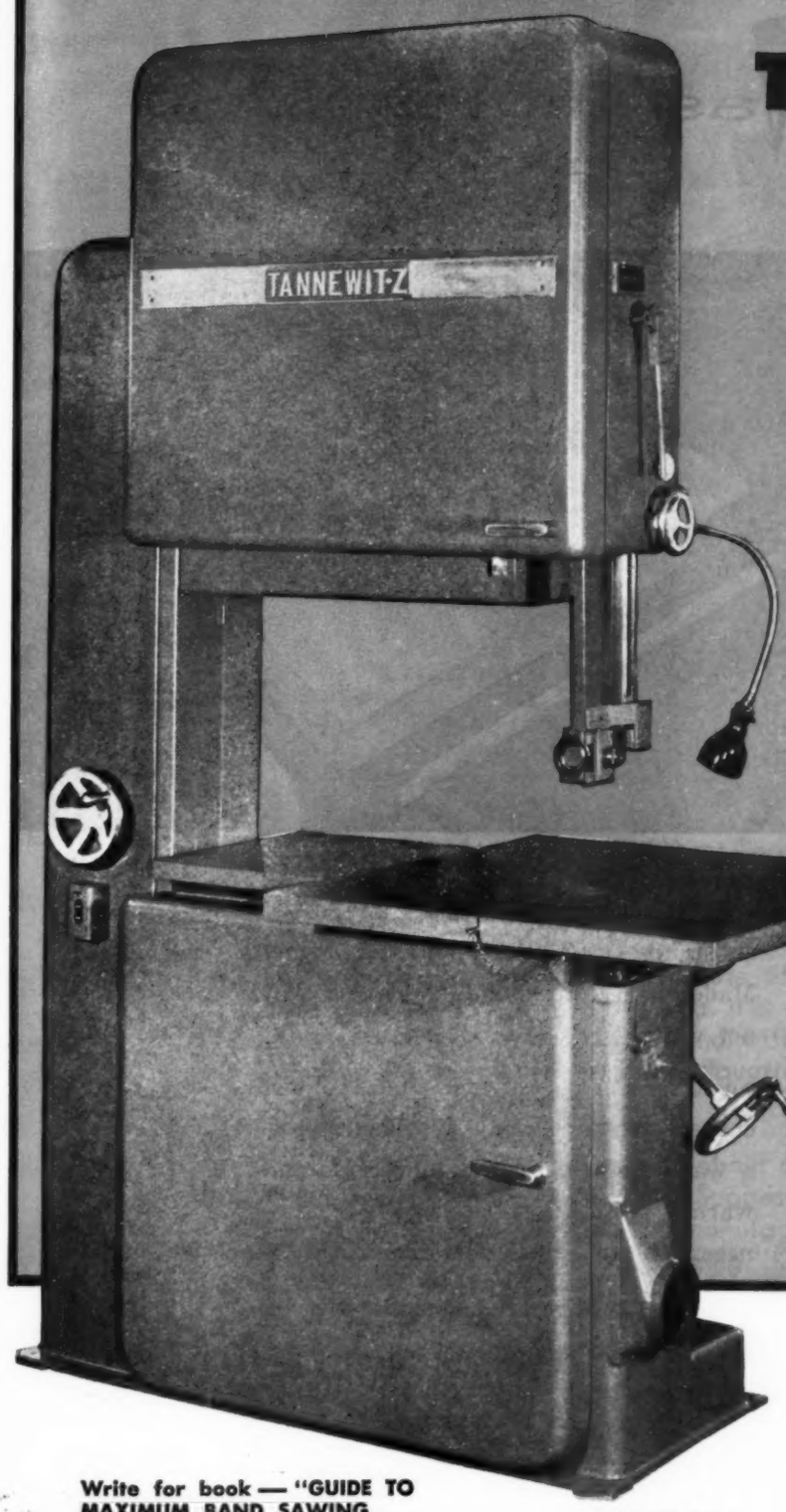

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BAND SAW

For many years TANNEWITZ HIGH SPEED BAND SAWS have been universally recognized as head and shoulders superior to everything in their field. And now with the advent of the TYPE GHN-E they offer these further highly advantageous features:

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2. **GREATER CAPACITY**—unobstructed from blade to column. Approximately 6 inches greater vertical clearance.
3. **EASIER BLADE TENSIONING** by remote control hand wheel on column.
4. **INSTANT BLADE TRACKING ADJUSTMENT** with handily located lever and window above it.
5. **AUTOMATIC HYDRAULIC AUTOMOBILE BRAKES** with or without automatic application when blade breaks.

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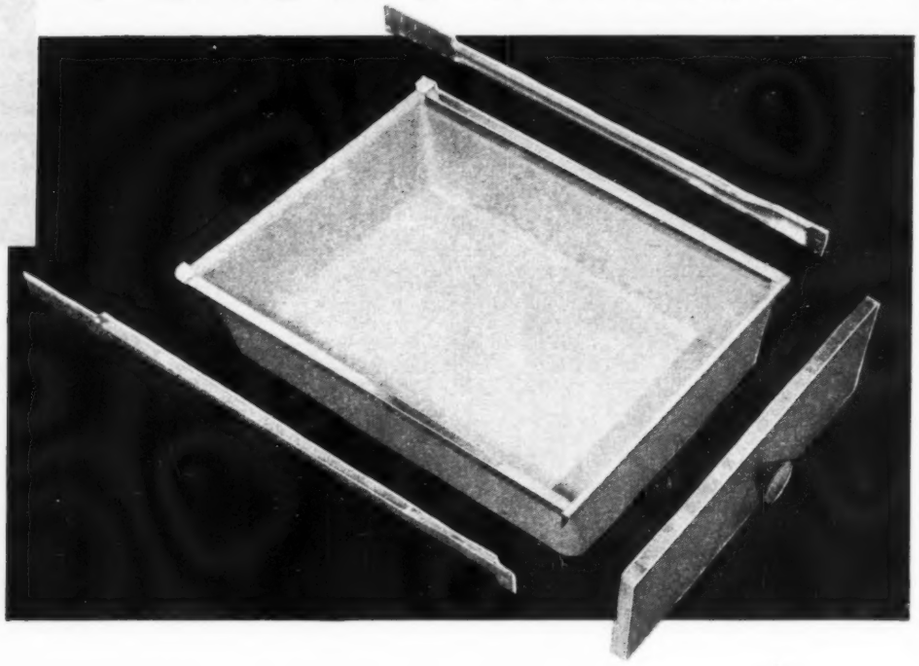
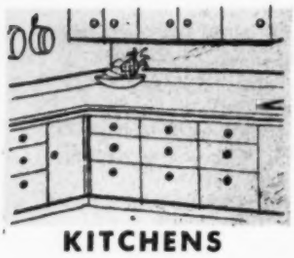
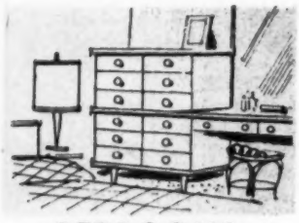


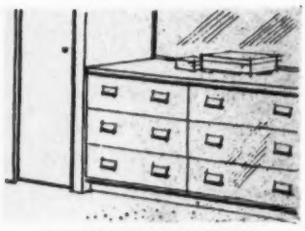
Ideal for:



KITCHENS



BEDROOMS



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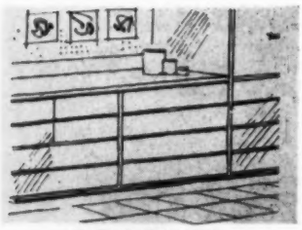

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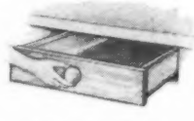

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- An architectural magazine estimates that there has been a 500% increase in the use of glued laminated lumber in the last three years. This has necessitated a constant study of new techniques and new methods in end use. For years Douglas fir was used almost exclusively. Now, however, the West Coast Lumbermen's Association has issued a new standard for utilization of West Coast hemlock. Called "Standard Specifications for Structural Glued Laminated West Coast Hemlock Lumber," the booklet is available from the association.

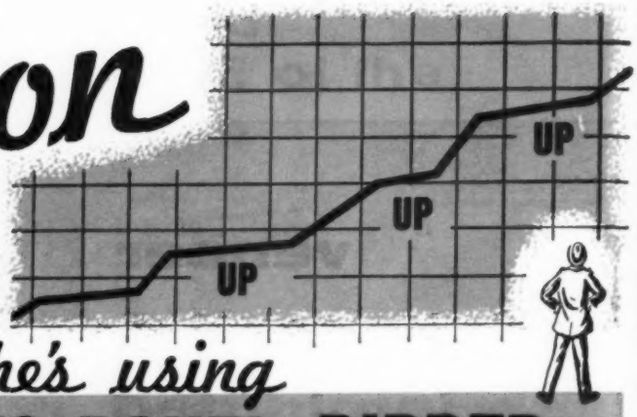
- The new Hardwood Plywood Institute office and laboratory is now under construction at Arlington, Va. It is scheduled for completion by January 1. Consolidating the national offices formerly in Chicago and Atlanta, Ga., this new national headquarters will include every modern facility for testing and research.

- Included in this section is a story about a West Coast firm that used TV to help sell fine hardwoods. Suggestion for telecast came from the TV station, and not from the manufacturer. More of this might be done locally in programs emphasizing "Know Your Town," etc.

- The Timber Engineering Co., National Lumber Manufacturer's research engineering affiliate, has inaugurated a plywood testing and quality control program for manufacturers of Douglas fir plywood. First clients are the Willamette National Lumber Co., Plywood Products Corp., and Western Veneer and Plywood Co., all of Oregon. According to the National Lumber Manufacturers Association, all inspected panels will be stamped "Teco Tested in Accordance with the Commercial Standard for Douglas Fir Plywood."

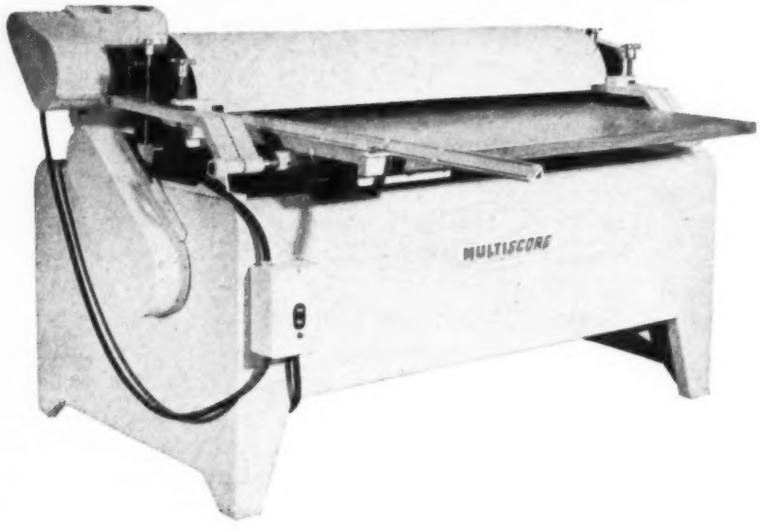
- The new program is an outgrowth of research performed by Teco to determine interior veneers qualifying under the Commercial Standards for CD-grade sheathing. In each plant where the control program is established, Teco will station a full-time technician, responsible to a supervisor in a new Teco office at Albany, Ore.

Production going



of course — he's using

MULTISCORE'S PANEL RIPPER



To the man who wants to enjoy watching his production curve rise, and rise, and rise, we offer a low cost, high production, multiple saw, designed with you in mind. The most economical multiple saw ever devised can produce in 1 hour, 26,000 linear feet of precisely sized strips from 15,000 square feet of stock 4x8 panels when all six carbide tipped blades are cruising at the recommended speed for ¼" material. Running at lesser speed, the MULTISCORE PANEL RIPPER will cut 9,600 sq. ft. of ¾" panels into 16,800 linear ft. of strips in 1 hour. AMAZING? Yes, but what is even more exciting is the many industries in which this expertly designed panel ripper can be used. Cabinet plants, luggage factories, toy manufacturing, box factories—any business interested in reducing plywood or pressed wood panels to parts with speed and precision. Efficient production means extra dollars in *your* pocket. Here are the features for "PRODUCTION PROFITS":

COMPACT	73"x59"x43"-shipping weight, 1200 lbs.
ECONOMICAL	Low cost makes the MULTISCORE PANEL RIPPER adaptable in hundreds of industries.
VERSATILE	1 to 6 carbide tipped saws on carefully balanced shaft active at one time. Saws repositioned quickly or unnecessary saws quickly inactivated. 50" max. cutting span, 100 linear ft. per min. max. feed.
POWERFUL	Powerful motors provided on individual job rated basis.
DEPENDABLE FEATURES	Infeed and outfeed rolls powered with dual speed control — safety clutch prevents jamming — main shaft and power feed motors equipped with starters and complete wiring.

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Designers-Manufacturers of

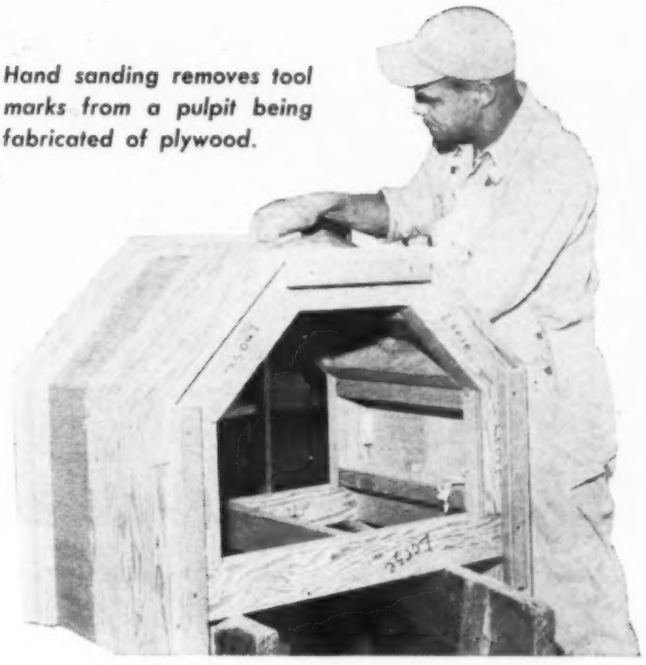
MULTISCORE PANEL GROOVER MULTISCORE "TEXTURE 1-11*" GROOVER

*DFPA Reg.

Emphasis on quality fixture production give Mullen Manufacturing Co. that . . .

MILLION-DOLLAR VOLUME

By Bert Goldrath



Hand sanding removes tool marks from a pulpit being fabricated of plywood.

If you were one of the millions of western viewers watching television on a certain evening last year, you would have been treated to a most unusual program; a leading corporation paying tribute to another for its fine woodworking craftsmanship. On that particular program, Richfield Oil Corporation devoted its half-hour to a "live" camera tour of San Francisco's Mullen Manufacturing Company, makers of quality fixtures and cabinetry for stores, offices, hotels, laboratories and churches throughout the west. The show was one in the "Success Story" series in which Richfield recognizes outstanding firms in various fields.

Occupying a modern two-story concrete building, with some 50,000 square feet of sprinkler-protected space, the company employs more than 100 skilled workmen. Its annual output exceeds $1,000,000 in value, placing it among the major concerns of its type on the Coast. A recent accomplishment was a $500,000 job involving the fabrication of some 30,000 square feet of American black walnut plywood into bank fixtures such as tellers' counters, partitions, railings and wall paneling, and its installation in five floors of the new 28-story First National Bank of Denver. The fact that the Mullen staff was able to successfully compete and carry through the job on a tight schedule is testimonial enough to the firm's resourcefulness.

Mullen Manufacturing Company is a workingman's wood production plant. Its founders were eight old-time craftsmen who, back in 1915 when the shop they were working for closed, chipped in $500 apiece and established their own joint wood working venture. John E. Mullen was president and gave the infant concern its name. One of the partners was Nils Nordstrand, whose son John is now head of the company.

John Nordstrand is also president of the Cabinet and Fixture Manufacturers Guild, which he describes as an "association of leading California manufacturers whose concern is the maintenance of high standards of quality in the industry. The guild emphasizes that cabinet making is the art and craft of producing fine wood products. It is the faithful execution of the architect's design, performed with integrity. It differs from other branches of the woodworking industry chiefly in the degree to which it employs detailed scale drawings for shop use, the extent of exactness followed in the machining, assembling, sanding and finishing—and its customary use of fine woods."

Mr. Nordstrand expresses his firm's obligation toward its customers as the precise development of the customer's product and specifications and, no less important, delivery of the job on schedule.

To accomplish this end the company subscribes to the guild's motto that, to do a fine job of cabinet work, the manufacturer should be equipped to:

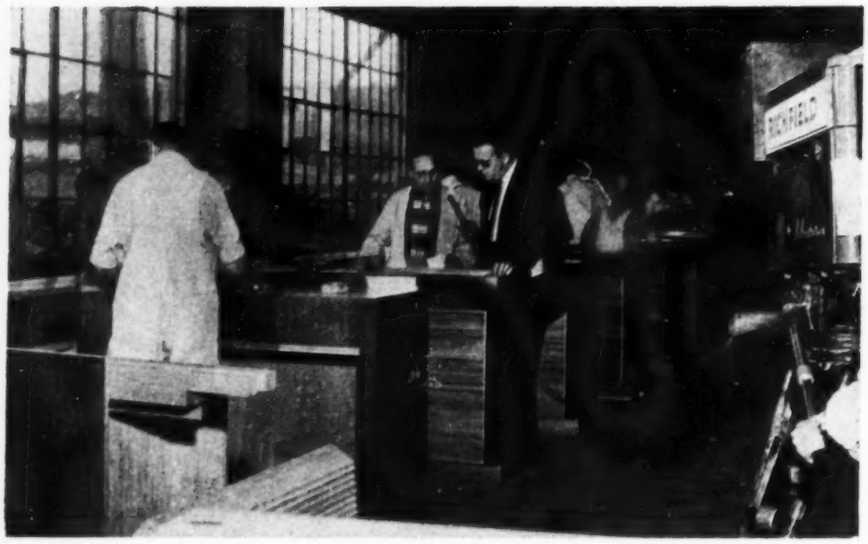
FABRICATE in his shop, where experienced cabinet detailers, specialized equipment and skilled cabinetmakers can accomplish the close-tolerance machining and assembly that are necessarily the basis of quality production.

FINISH in his shop, where journeyman finishers can use specialty spray equipment under controlled conditions.

INSTALL his own job, with his crew of specialists trained in this highly skilled trade.

In this way, said Mr. Nordstrand, the manufacturer has control over a smoothly-functioning team from the start of a job to its final acceptance by the architect, with sole responsibility for the entire work.

He pointed out that, although the Denver bank job is more than a thousand miles removed from the Mullen plant, it isn't necessary to



TV camera (right) shoots live telecast of plant activities. Here MC Bob Day interviews Factory Superintendent Max Fuller.

go much beyond downtown San Francisco to see how those high quality standards have won the company job after job from the honor roll of western commerce and industry.

For example, practically all the fixtures in all the Woolworth stores west of the Rockies have been produced by Mullen for many years. The Emporium-Capewell department stores, for whom Mullen recently completed a $400,000 fixture job in a Hayward, Calif., shopping center, are typical of their extensive work in this vast and complex field. The growing chain of Roos-Atkins clothing stores owe much of their distinctive atmosphere to Mullen installations. The superior cabinetry in the lobby and "Top O' the Mark" at the Mark Hopkins hotel bear the Mullen touch. The list could go on, even including such unusual jobs as the ship's-prow facade at Bernstein's Fish Grotto—a San Francisco landmark—and the exquisite ecclesiastical wood sculptures by Spero Anargyros.

The high measure of quality is credited as much to the workmen of the Mullen organization as to any other source. Some of these men have been on the Mullen payroll 25 to 30 years. One of these is Max Fuller, factory superintendent, whose tenure dates back to 1924. Other veterans are foremen Bob Van Steen, cabinet shop; Ed Campion, finishing department, and Bill Sullivan, installation department.

Mullen products include all types of merchandising fixtures for stores, such as showcases, wall cases, counters and displays; ecclesiastical furnishings—altars, reredos (the partition back of an altar), railings, pulpits, pews, and confessionals; special cabinet work for public buildings, schools and colleges; bank fixtures, laboratory tables and equipment, and fixtures for restaurants.

Everything made of wood that goes into an installation, except for furniture, can be made, finished and installed by Mullen. The company goes beyond the woodworking aspect of a job to install glass, metal and plastic components as well as electrical wiring and fixtures.

Raw materials consist largely of fir and various hardwood plywoods, comprising about 80% of the total, with solid stock accounting for the balance. Domestic woods such as birch, maple, oak and walnut are Mullen's "bread and butter" woods, making up approximately 95% of the output. Also used are such imported exotic woods as mahogany, teak, ebony, rosewood and genesero. In the past year the company has processed over 150,000 square feet of fir plywood and about 60,000 square feet of hardwood plywood.

While much of Mullen's volume is in repeat business from long-time satisfied customers, or from referrals, the company is active in competitive bidding for work originating in architects' offices. In order to keep the estimators fully informed, a cost survey and analysis are made of each job. These records are maintained on a current basis; performance is checked against original estimates, and conclusions analyzed for the estimators' use in preparing other bids.

Before a job can be created out of wood it is first "built" on paper in the drafting department. This section is located close to the manufacturing area so that draftsmen can frequently make a personal check on the progress of their work.

Manufacturing is divided into four distinct phases: machining, which takes up the whole first floor, and assembling, finishing and trimming, all on the second floor. The two levels are connected by an elevator. Fork lift trucks convey raw stock from the adjacent warehouse into the shop.

Machine room operations are broken down into the headings of surfacing, selection, cutting to size and shaping. As an example of painstaking quality control, stock is surfaced before it is selected so that the true color, texture and grain will be revealed. Matching is a matter of coordinating all these variables to achieve all the richness inherent in the materials.

Some of the newer equipment includes an automatic feed straight line rip saw with a capacity of 5,000 lineal f.p.h.; cabinet planer and a double end trim saw. Fitted out to perform all woodworking tasks, the machine room also includes band and cutoff saws, planers, mortiser, tenoner, sticker, shaper, jointer, borers, dovetailer, glue jointer, hydraulic and manual

presses, glue presses for laminating special core stock for doors, and drum, edge and belt sanders. The satin-smooth finish necessary to this type of production is the result of numerous sanding operations during several phases preceding final assembly.

Machined parts for a particular job are loaded onto individual trucks or dollies and carted with their production record to the upstairs assembly department, where the superintendent distributes parts for sub-assembly. Much of the work from this point on is bench work, but it is made more efficient by the use of such modern bench tools as power-driven jointers, routers, drills and air hammers.

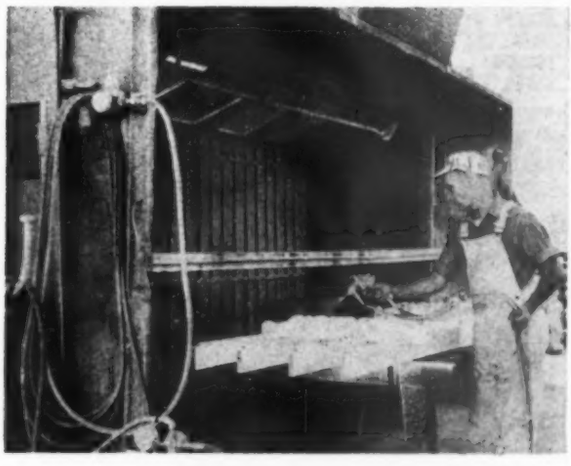
Hardware is usually checked at this point for fit, but not yet installed. Under a system of constant inspection, whole units are assembled, joined and glued together, and fine-sanded to remove machine marks. Once a final check assures that units are leveled and fitted they proceed into the finishing department.

The finishing foreman has previously evaluated finishing requirements, submitted samples to the customer and had it approved in advance. When the job moves up he is ready with his batches of properly-mixed stains, sealers and lacquers. Facilities consist of two spray stations at a booth with a continuously-circulating feed system from remote materials. Finishes are stored in 55-gallon drums in a fire-proof vault. Revolving paddles keep stirring the material in the drums, as it goes through lines under pressure. If it is not being used it goes through a bypass so that it is kept circulating. There are three separate systems for the three basic materials. Stain is batched by individual lot and may be applied by brush or spray. Sealer and lacquer flow are controlled by valves at the spray stations.

Many different skills are demanded in the final step—the trim department, where hardware and electrical components are installed, along with such other materials as plastic, glass and metal.

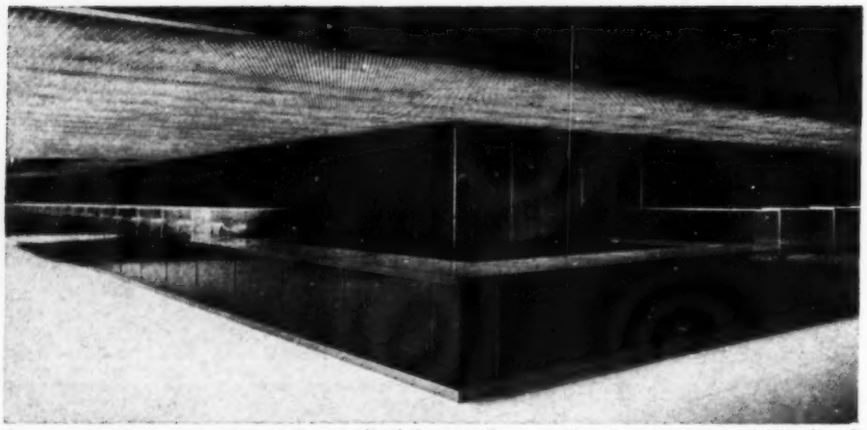
Man at left spreads adhesive on plywood for laminating with sheet plastic in shop's big hydraulic press.

Gluing and clamping components of a fixture base in the assembly section.



Two-station spray booth in finishing department has three feed systems in constant circulation.

Plywood shelving is being fitted here with wood molding in the assembly department.



Tellers counters made and installed by Mullen at the First National Bank of Denver.

Snugly wrapped and completely assembled, units are shipped in padded 40-foot vans. The installation crew has already made preparations for receiving the shipment. In some cases they may have been on the job for a month, to insure that all the preparatory work is in order.

Plywood, the indispensable material, is used mainly in ¾" thickness, although some jobs call for ¼" and intermediate thicknesses. While much of the woodworkers' art is necessarily concealed in the structure of the product, plywood presents the surface finish the customer admires for its beauty and craftsmanship.

Wood Specimen Book

The Chester B. Stem Company is now the North American distributor for a fine book describing various wood species. The book illustrates 100 woods with color plates. The practical value and convenience of having in book form for instant reference faithful color reproductions of 100 woods of commercial importance, together with concise information about their growth, distribution, properties and uses hardly needs to be stressed. The book includes a drawing and description of the structure of each wood and is an additional feature of special interest to the wood technologist.

Throughout the book the standard names, as recommended in the British Standard Nomenclature of Commercial Timbers, are used. Other names, trade and local, are indexed. The book, which is printed in England, is of outstanding use and interest to all professional and industrial users of wood.

For literature describing "Wood Specimens," write to Chester B. Stem, Inc., New Albany, Indiana.

Use postpaid card. Circle No. 2

Government Specifications Listed

To guide manufacturers working on government orders, the Borden Chemical Company has issued a 12-page booklet listing all Borden chemical products recommended to comply with U. S. government specifications.

Included are adhesives, coatings, sealers and vinyl tubing, as well as products used in the making of various paints. The booklet lists the products by type, with Borden brand names, the specifications each meets, and the name and address of the department manufacturing each item.

Copies of the booklet may be obtained from the Borden Chemical Company, Government Services Department, 350 Madison Avenue, New York 17, New York.

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For Manufacturers, Dealers Anyone Who Works Wth VENEER, PLYWOOD, CUT LUMBER, BOXES, Etc.

A handy book of accurate tables for quickly determining square feet contents of veneer and the cubic contents of logs, complete to fractional units.

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IN DOOR SIZES ONLY.
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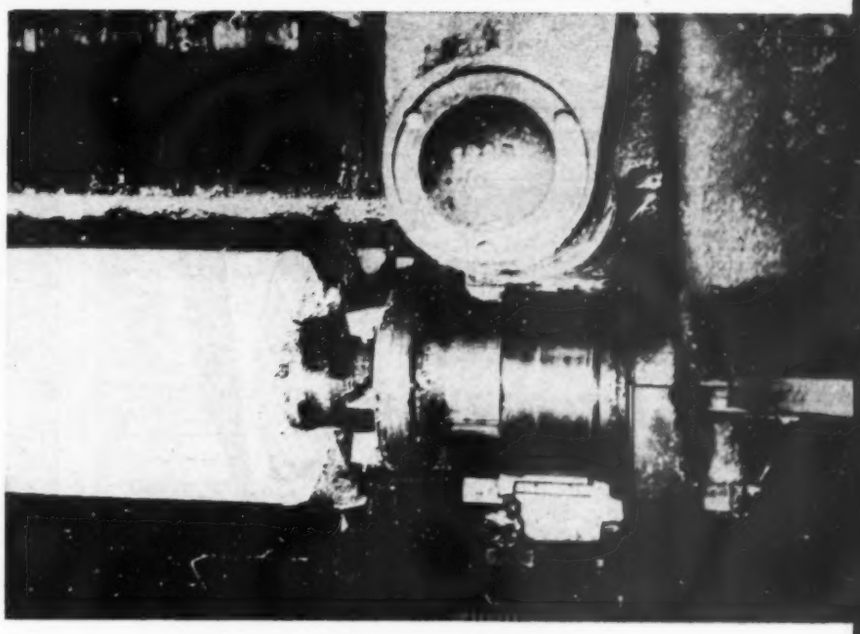

Close-up view of dual-spindle, hydraulically-operated chuck on Merritt-Solem lathe in the plant of Canadian Forest Products, Ltd., Pacific Veneer and Plywood Division, New Westminster, British Columbia. The bolt has been turned down to a point where the knife is rather closely approaching the outer, ring-type chuck. Therefore, this chuck is shown in process of retraction to the right, leaving only the smaller-diameter chuck engaged. The smaller chuck has plenty of gripping power to adequately hold the bolt for the balance of the peeling. With only the smaller-diameter chuck holding, the knife can continue to advance with impunity until the bolt has been turned down to 5½" diameter.

SOLVING THE FAT CORE PROGRAM

By John E. Hyler

Fat cores and small-diameter logs have always introduced a problem at rotary lathes, from the standpoint of getting the most possible veneer from raw material. Inevitably, there is much variation in log or block diameter. Logs large in diameter require log chucks which are also of considerable diameter. Otherwise, the chucks will not withstand the severe torsional strain caused by the lathe knife and nose bar.

On a large-diameter log, the strain or pull is magnified by a long radius or leverage on the log cross-section. Consequently, if one uses small-diameter

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Low initial cost, long and trouble-free life, and complete customer satisfaction and confidence displayed by over 280 laboratory and production installations, truly make the WILLIAMS-WHITE Hydraulic Press the hallmark of the industry.

A typical example of repeat orders is the installation of two 572-ton, 106" x 54" hot plate presses, illustrated, in the Merlin, Ore., plant of Bate Lumber Company.

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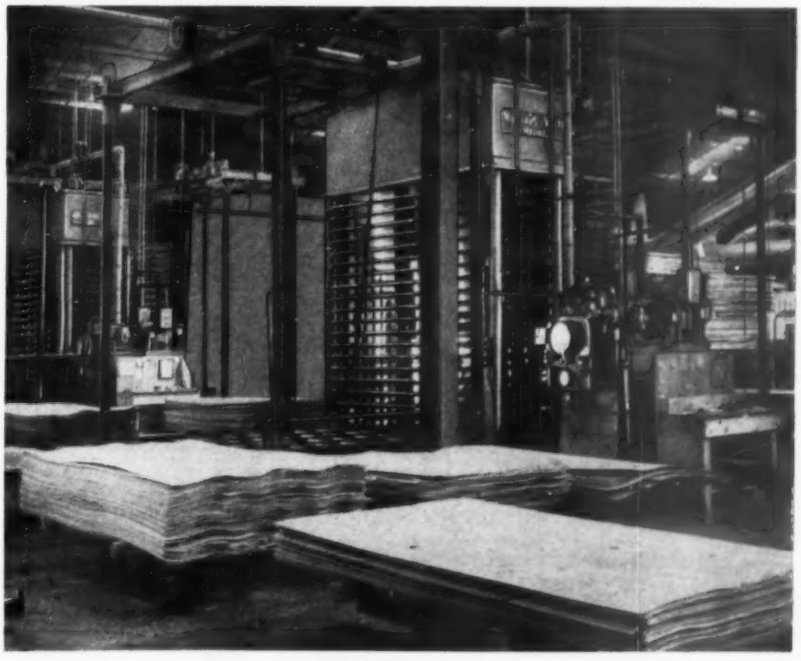
BUILDERS OF MACHINERY SINCE 1854



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ALLIED NORTHWEST MACH. TOOL CORP., Portland, Ore.
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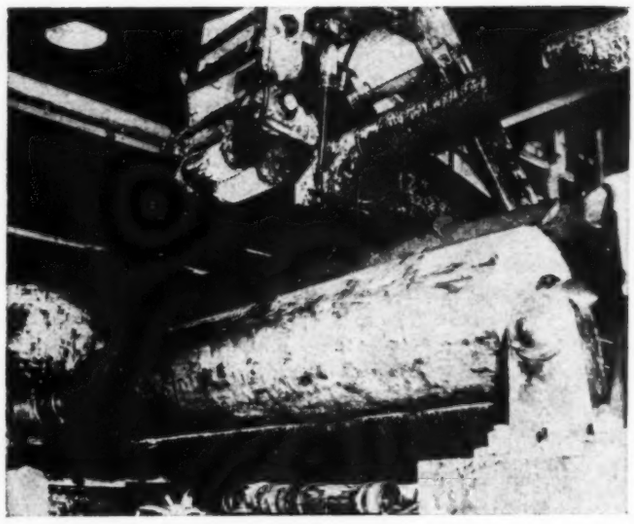
200 EIGHTH ST. • MOLINE, ILLINOIS
PRESSES • BULLDOZERS • BENDERS • PUNCHES • SHEARS

American
streamlined
comb grained
Veneer

WALNUT
MAPLE
ASH
OAK
CHERRY

The most modern methods, equipment and techniques are used in our new plant for manufacturing highest quality veneer. Investigate our service and complete facilities now!

Hill Bros. Veneer Co. Inc.
Edinburg Indiana



chucks on large-diameter logs, resistance to turning, imposed by the knife and nose bar, will tear the log loose from the gripping action of the chucks, and spin it on the chucks. Since the knife on the rotary lathe must be longer than blocks being processed, it is always necessary that a log cores be left somewhat greater in diameter than log chucks employed, to prevent any possibility of running the knife into the chucks and ruining it.

Different methods of dealing with this proposition have been tried over the years, with the idea in mind of turning log cores to smaller diameters and thereby obtaining a greater amount of veneer from each bolt. It became obvious that after fat cores were removed from lathes where large logs were being turned, those cores could be taken to a smaller lathe, sometimes referred to as a core lathe, where they could be re-chucked and further reduced.

Re-Chucking Means Lost Time

However, while this was practiced to some considerable extent, it had definite drawbacks. Additional man-hours were inevitably involved in re-chucking the fat cores and turning them down farther. Moreover, there was the additional investment in a small lathe, plus the fact that the amount which could be turned from each core was small, as against extra time required for chucking and handling. It was out of this situation, chiefly, that automatic lathe chargers came into existence, the first ones being applied mostly to core lathes.

A further complication entered into any operation having to do with reduction of fat cores. This had specific reference to *longer* logs being reduced in large rotary lathes, where the twin problem of deflection and vibration entered. The greater the length of logs being reduced to veneer, the greater was the amount of resistance imposed by the knife and nose bar on any given diameter. Consequently, the greater was the over-all amount of knife and nose bar thrust.

Added to this was the fact that at any given core diameter, the *longer* the core, the more liable it was to deflection or vibration. Thus, even where fat cores

This close-up view of a Merritt-Solem rotary lathe shows the tubular cross beam located over the lathe, parallel with the line of spindle centers. The special bracket welded to the beam, maintaining a given position rigidly, is clearly seen. At the extreme right of this bracket, somewhat out of sight, is the trunnion or pivotal point for the swinging action of the holddown device. Note the power cylinder by means of which the holddown device is lifted high out of contact with the log (in the position shown here), or allowed to swing downward until the two rollers make two-line contact with the log, after it has been sufficiently reduced in diameter. We are here looking at the log side of the lathe, on which side the rollers take their bearing. The veneer knife and nose bar impose their thrust from the opposite or veneer side.

were reduced by chucking and handling them a second time on a core lathe, it was usually necessary to cut fat cores of any considerable length in two, at about the center, before processing them again. This being true, additional labor was involved in cutting cores to length, plus the fact that all veneer salvaged from fat cores was of relatively short length. These facts remained true, regardless of the particular type of log charger employed in connection with the lathe.

Retractable Chucking Plus Steady Rest

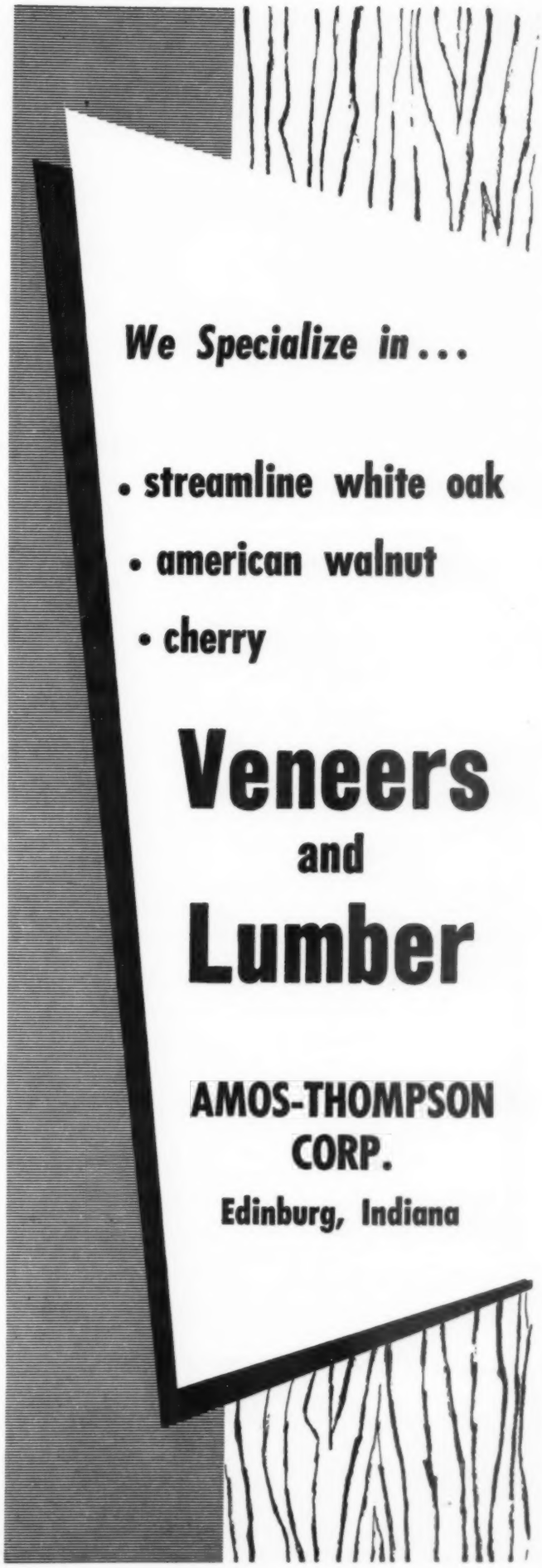
A highly interesting solution to this compound problem has been worked out in the plant of the Pacific Veneer and Plywood Division of Canadian Forest Products, Ltd., at New Westminster, British Columbia, where three Merritt-Solem rotary lathes are in operation. In this plant, a retractable chucking device is used on one of these lathes, which has a 110″ knife and a 60″ swing. This retractable chuck arrangement is hydraulically operated; it consists of a larger, ring-type chuck, encircling a chuck of smaller diameter on the dogging end of the machine.

Through use of this device, plus a special power rest or holddown, this firm is able to peel logs to a 5½″ diameter, giving a resultant core 1/16″ smaller in diameter in the center than at the outside. They are able to cut a perfect 4′ sheet down to the minimum diameter mentioned. This equipment, developed by Canadian Forest Products, Ltd., is designed particularly for the Merritt lathes they have in operation, and is easily adaptable to them. The company has applied for patents on both devices.

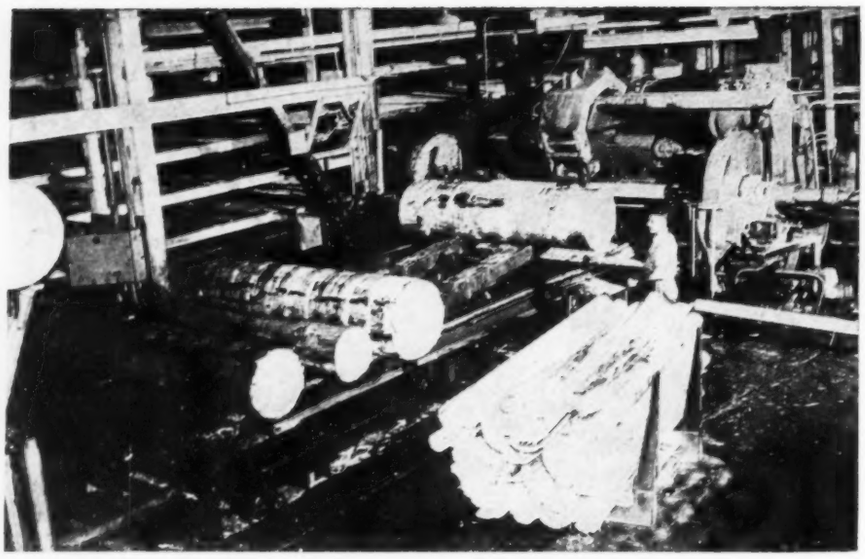
The holddown facility, or power rest, employed is used on all three of the lathes, two of which have a 110″ knife and 60″ swing. The remaining lathe has a 132″ knife with a 60″ swing. The holddown is designed so as to provide a counter thrust to that imparted by the knife and nose bar. A heavy walled tube, installed as a cross above the level of the lathe, supports the holddown.

Holddown Design And Mounting

The holddown proper, which has a swinging action,



For information about any advertised product, see the Advertisers Index and Action Card inside back cover



This view of the Merritt-Solem lathe at work in the plant of Canadian Forest Products, Ltd., also gives a view of the special log-loading equipment, by means of which logs are loaded quickly and accurately. Note (on the special skid in the foreground) the extremely small diameters to which log cores have been reduced. A similar small-diameter log core is seen in the lathe, ready for discharge, with the holddown facility lifting from its contact therewith.

upward out of the working area or downward to contact the small diameter log or fat core, is supported from a specially developed bracket which is welded to the tubular cross beam mentioned. A trunnion is provided at one point on the large bracket, on the veneer side of the machine; on this trunnion the holddown swings up or down. On the log side of the bracket, a vertically disposed power cylinder functions either to lift the holddown, or lower it into contact with the log. The power cylinder is also provided with a trunnion mounting, of necessity.

Design of the device is such that two rollers contact the revolving surface of the log, providing two-line contact at the point of engagement near the center length of the bolt or core. Contact of the rolls, and weight they impose on the revolving core, is at a point nearly enough diametrically opposite the location where thrust is imparted by the knife and nose bar to provide the necessary counter thrust.

Photographs in this article through the courtesy of Merritt-Solem Div., Solem Machine Co., Lockport, N.Y., and Canadian Forest Products, Ltd., New Westminster, B.C., Canada.

COMPLETE PLYWOOD SERVICE

Located midway between New York and Chicago, our complete facilities are available to you with prompt deliveries and engineers to service all of your plywood requirements.

- Cabinet Doors
- Sliding Doors
- Institutional Doors
- Hollow Core Doors
- Architectural
- Plastic Faced
- Curved Panels
- All types

cut to size—shaped—bored—finished

JAMESTOWN Quality Hardwood PLYWOOD

Jamestown Veneer and Plywood Corporation
JAMESTOWN, N. Y.

BeVeG VENEERS

OUR BEST ONLY IN ALL FINE NORTHERN HARDWOOD FACE VENEERS

BIRDS EYE VENEER CO.
BOX 317 ESCANABA, MICH.

Industry News

Dr. Harold Gatslick is now associate professor in the department of forestry and wildlife management, College of Agriculture, University of Massachusetts. Previously he was on the staff of the State University College of Forestry, Syracuse University, Syracuse, N.Y.

New vice-president in research and development for the Timber Engineering Co. is **William H. Scheick.** He succeeds **Carl A. Rishell,** vice-president, who will retire the first of the year.

J. Dan Malone has been appointed general sales manager of the Enterprise Co., Columbiana, Ohio. He was formerly with the H. B. Smith Machine Co., Smithville, N. J.

Aetna Plywood & Veneer Company has announced the election of new officers: Don L. Davis, Jr., **president; Arthur Schwanke, Jr.,** executive vice-president; **Robert C. Williams,** vice-president, sales; **Richard Schwanke,** treasurer; and **Donald M. Streckenbach,** secretary. **Don L. Davis, Sr.** and **Arthur Schwanke, Sr.,** have assumed the office of co-chairmen of the board.

The appointments of **C. J. Petry** as general superintendent and **P. W. Coffman** as assistant general superintendent of Acme Steel Co., Chicago, were recently announced.

Frank P. Lucier has been appointed sales manager of Stanley Electric Tools, division of The Stanley Works.

Dick Labus has joined Atkins Saw Div., Borg-Warner, as sales representative for eastern Pennsylvania, southern New Jersey, Delaware, Maryland and Washington, D.C.

Dr. Albert W. Stout, one of the foremost authorities in the field of forest products research, has joined Georgia-Pacific Corporation's department of research and development at its central laboratory in Hillsboro, Ore.

Gray Products Co., Virginia manufacturer of flakecore and particle board, has appointed **Eugene C. Dorsa** as sales representative for the states of New York, Penn., N.J. and Conn.

John P. Schlick has been appointed secretary-treasurer of U. S. Plywood Corporation. **Simon Ottinger** is retiring as vice-president and secretary. He will continue as a director.

Robert C. Tyo has been named president of the Porter-Cable Machine Company. He succeeds **DeAlton J. Ridings** who will continue as chairman of the board.

American Forest Products Industries, Inc., re-elected **John B. Veach** president.

J. D. Bronson, Cascade Lumber Co., Yakima, Wash., and **John H. Hinman,** International Paper Co., New York, were re-elected vice-presidents. **D. B. Frampton,** D. B. Frampton & Co., Columbus, Ohio, was re-elected treasurer. **Charles A. Gillett** was re-elected secretary.

Robert M. Ingram, president and general manager of the E. C. Miller Cedar Lumber Co., Aberdeen, Wash., has been elected president of the National Lumber Manufacturers Association. He succeeds **N. Floyd McGowin** who has been elected N.L.M.A. board chairman. **Thomas J. McHugh,** president of the Atlantic Lumber Co., was elected first vice-president.

National Hardwood Lumber Association elected **Bernard Bock,** Montreal, Que., president of the association. He succeeds **H. A. Hanlon. Franklin T. Griffin** of Chicago and **Mark Townsend** of Stuttgart, Ark., were re-elected vice-presidents. **James P. Hamer,** Kenova, W. Va., was elected third vice-president.

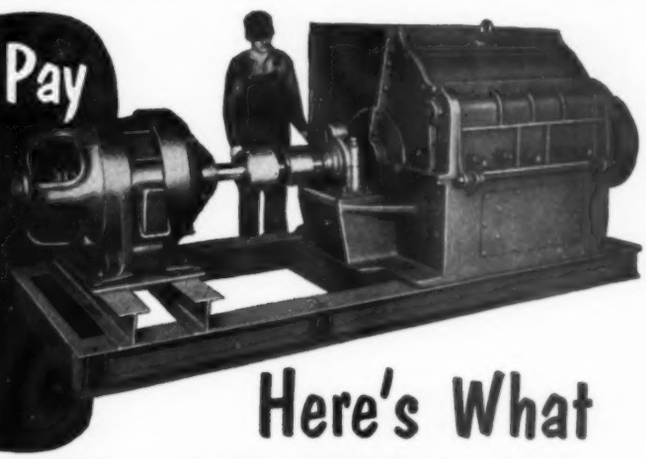
Hardboard Test Procedures

The Hardboard Association announces that it has compiled standardized methods for testing the physical and mechanical properties of hardboard.

These testing methods are available free in a 23-page loose-leaf folder, illustrated with drawings, entitled "Proposed Test Procedures for Hardboard." Copies may be obtained by writing Donald Linville, executive secretary, Hardboard Association, 205 West Wacker Drive, Chicago 6, Illinois.

General information in the folder covers test specimens, sampling of the material, conditioning of the material and reporting of tests. Physical properties reported include thickness, moisture content, specific gravity, water absorption and swelling. Mechanical properties covered are static bending, residual strength, tensile strength parallel to the surface and tensile strength perpendicular to the surface.

It Will Pay You To CHECK These Facts!



Here's What

WILLIAM'S "NO-NIFE" HOGS

✓ Can Do For You:

1. Increase The Heating Value Of Your Wood Scrap!

When reduced to chip form by hogging, wood burns more evenly—gets *all* the heat value possible. Unhogged slabs, trimmings, large pieces, restrict air flow, smother fire, result in inefficient combustion.

2. Improve Quality Of Wood Flour And Sawdust!

Processing wood scrap with a Williams Hog, for resale in the form of wood flour or sawdust, assures more uniform grinding and sizing—much lower labor costs—reduced power requirements.

3. Reduce Handling Cost As Much As 75%!

One man firing wood in chips can handle the same tonnage as would require three men if fuel scrap remained in awkward lengths and pieces that necessitate individual handling.

4. Your Operation May Permit Complete Automatic Handling

Williams has made many automatic installations to hog and convey waste wood to stoker or boiler at tremendous savings in handling expense. Other installations to automatically grind, separate and package wood flour and sawdust result in phenomenal reductions in cost.

Williams equipment will actually pay for itself in a few months, then continue to produce extra profits for many years. Investigate now!

Write for Details

WILLIAMS BUILDS A COMPLETE LINE • Hogging, Grinding & Shredding Machines • Vibrating Screens • Conveying Systems • Air & Mechanical Separators • Complete "Packaged" Plants • Cyclone Collectors

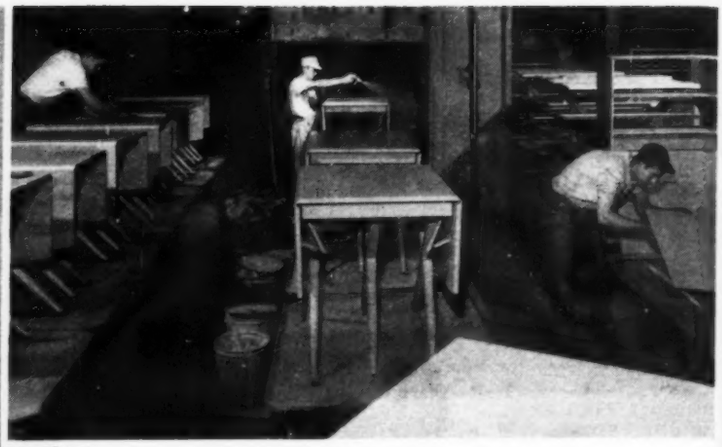
WILLIAMS PATENT CRUSHER & PULVERIZER CO. • 808 ST. LOUIS AVE., ST. LOUIS 6, MO.

WILLIAMS

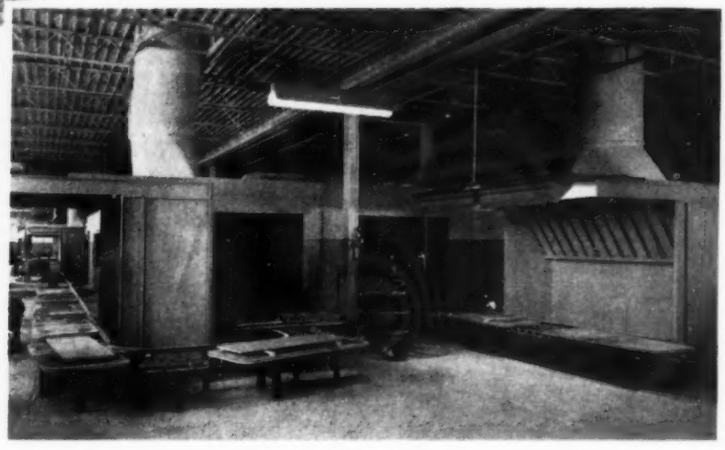
CRUSHERS GRINDERS SHREDDERS

OLDEST AND LARGEST MANUFACTURER OF HAMMER MILLS IN THE WORLD

GROWING PAINS ?



The Craddock Furniture Company has added DeBurgh Conveyors to their line four different times to match their growing business . . . taking advantage of week ends and holiday shut down periods to extend the operations of their sanding, toning, drying and shipping departments.



While tooling for their new models, Bergsma Brothers added more DeBurgh conveyors completing the installation in just five days. These companies are typical of many manufacturers that have expedited their expanded production with Koch engineering service.

Is your production outgrowing your capacity?

It's easy to expand your

CONVEYORIZED DE BURGH FINISHING SYSTEMS

write for
Data File
IF 108

THE FLEXIBILITY of the DeBurgh system makes it a cinch to alter your existing layout to meet future production planning. DeBurgh conveyors can be added easily to enlarge or improve the capacity of any finishing operation. Plan now to use the slack winter season to extend your production lines. Call Koch's specialists for a free layout of your plant. Let us show you how you can achieve maximum production with minimum shut-down time at least cost.

GEORGE KOCH SONS, INC.
Evansville 4, Indiana

finishing section

- Wood paneling, according to a West Coast specialist, is best finished before installing. This authority recommends fitting the paneling, finishing and then installing. Uniformity of color and ease of application, are good reasons. Prefinished panels bring to consumer a better finish than can be applied after panel is in place.

- Read this month's feature on finishing to see how one manufacturer adapted dipping conditions to suit his operation. Trial and error method led to eventual development of blowers and adequate dip tank.

- Watch for the first advertisement by the National Wood Promotion Program, National Lumber Manufacturers Association. This is scheduled for appearance in early '59. The program is moving ahead with amazing speed. Included in the plans is a booklet "Livability Unlimited." This is slanted toward the consumer and stresses wood utilization in the home.

- Scheduled for publication early in 1959—an exclusive interview given to our editorial staff on the new pressure curtain method of paint application. We have seen the equipment in operation and will report on an installation, including an interview with one of the paint suppliers.

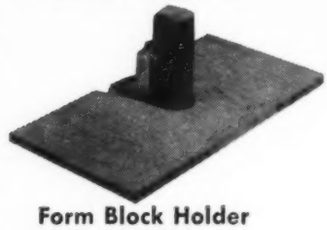
- Enterprising finishes supplier is using a novel method for merchandising his finishes. Each finish is presented in a booklet form. Booklet, however, contains only minimum amount of descriptive copy and one full page which is covered by a piece of veneer finished in the shade. This gives furniture manufacturer a sample library that shows actual appearance of finishes on wood.

FASTER Smoother Sanding

PEARSON BLOCK & EDGE SANDER

Standard equipment includes such items as:

Pearson Butt Block



Form Block Holder with Steel Plate

—also all parts identified on photo of the machine above. Complete specifications sent on request.

Pearson Hand Slide Block

With each machine, customer receives either a Pearson Hand Slide Block, made to any mould, or felt block, shaped to any mould, to be used with the Pearson Butt Block.

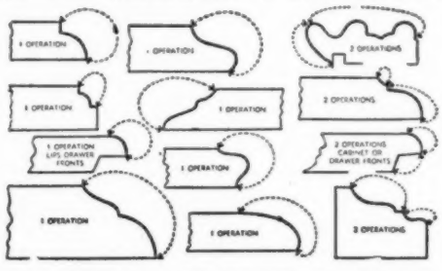
Today you must be able to produce the finest surface at lowest cost to meet competition. This is the machine you should have! Sands straight mouldings, straight and round corners—all in one simple operation. Can also be easily converted to upright spindle sander. Equipped with 3 h.p. motor for five types of sanding—stationary mould block, hand slide block, curved edge, straight edge and spool (all types of curves). Pearson patented heads fit motor spindle. Write for details.

HERE ARE TYPICAL SHAPES WHICH CAN BE SANDED PERFECTLY!

These are but a few of the shapes that can be sanded perfectly with the exclusive Pearson Hand Slide Blocks. The form is lined with high-speed babbitt for longer life. Blocks are for straight mouldings only.

WE SELL DIRECT!

This enables us to personally instruct your operators to get maximum efficiency from the machine.

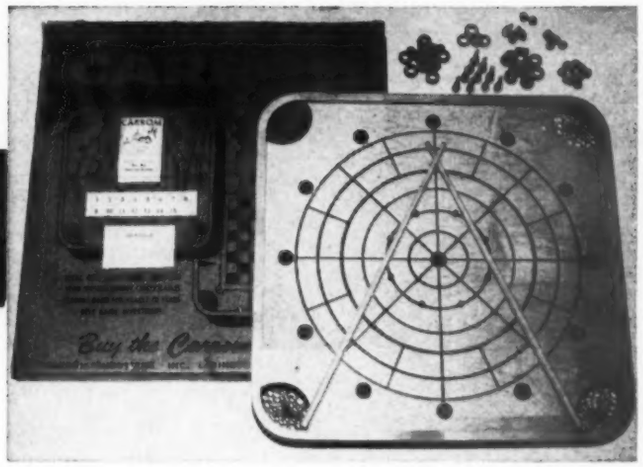


We also manufacture the well-known Pearson Model "A" Spindle Sander!

PEARSON SANDING MACHINE CO., INC.

HIGH POINT, NORTH CAROLINA

KEEP 'EM PLAYING with CARROM GAMES



By Darrell Ward
Field Editor

▼ The perennial game of Carroms, as familiar to great grandparents as to younger people of today, comes from an old but efficient plant at Ludington, Michigan. Carrom Industries, Inc., was first established as the Ludington Novelty Co. in 1889 to build and market the basic game board originated and popularized by Henry L. Haskell, founder of the Haskelite Corporation of Grand Rapids.

Carrom has weathered several depressions as well as the prosperous times in between until now the name has become so deeply engrained in American tradition as to be almost an institution as much as a game. Its popularity has spread beyond the borders of the U. S. A. into many foreign countries. Not too long ago, the king of Sweden was visited by a group of Americans, and during some diplomatic gatherings, pulled out a Carron board to entertain the children present. The king took it for granted that American children rated the Carrom board high on the list of preferred toys.

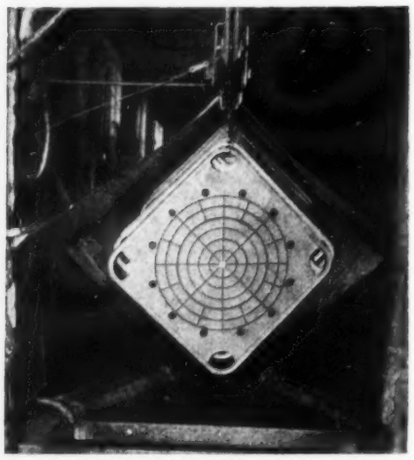
The Carrom plant covers about 130,000 square feet of floor space with employment ranging from 150 upward. Products are divided into two main groups. The first is a wide variety of over 25 different skill games and child development toys. The second is institutional furniture, begun about 20 years ago and now a substantial part of the company's total volume of sales.

Of course, in both quantity of units and historical age, the Carrom game-board is the most significant of any single item produced. It is estimated that in the 69 years of company history, a very conservative guess of over 5,000,000 Carrom boards have been sold.

Since the game is essentially a printed plywood board with wood rim, corner pockets, pegs and playing pieces, our special interest was finishing and final assembly techniques used in manufacturing these boards. Conforming to standard practices of quality work in the early days of Carrom board history, the original finish consisted of several coats of varnish, carefully brushed on by hand and sanded between coats. The work, itself, began as part-time employment for local people in their homes and by professional house painters at the factory between other jobs. Finishing, at that time, required considerable skill in handling a varnishing brush, in addition to the tedious drying and sanding ahead of the final high gloss finish coat. Boards were finished on a piecework basis at nominal rates prevailing in that period.

Plywood Carrom board design comes already printed from a box printing machine before solid wood side rails are assembled. White goods clean up consists of removing burrs, rounding sharp edges and over-all smoothing of surface prior to dipping. Girl wraps fingers with masking tape for protection against splinters and to get better grasp of abrasive paper.

Dipping is done by hand in tank of high solids, slow drying lacquer for single coat finish. Fire protection, approved by underwriters, is automatic. Heat would melt fusible link connected to retaining wire fastened to bottom of extinguisher (see arrow). Extinguisher would then discharge foam through hose connection to lacquer dip tank and snuff out fire.



The hood beyond the dip tank retains fumes from solvents and helps retard drying or flashing of surface until material is well drained. This helps to prevent runs and makes better flow-out.

As lacquer type materials became popular, there was a gradual change away from varnish finishes. The bridging characteristics of lacquer required fewer coats to fill and smooth the surface. The finish then consisted of a sealer coat, level sanding, and two coats of lacquer.

Later, high solids material permitted closer approach to a single coat finish. All of the lacquer type finishes were sprayed.

As costs continued to mount, problems occurred. A very large percentage of Carrom's distribution is through catalog and mail order houses. In view of this fact, price was a most serious consideration. Second to price, the quality of finish had to be the best possible in line with price range. For a long time, it has been mail order practice to guarantee satisfaction or return of purchase price.

Yet, as is the typical American custom in industry, costs kept rising. But, if mail order business was to continue profitably, selling price and good quality finish must remain steady. It seemed that opposite ends of the law of supply and demand were slowly squeezing Carrom in the middle. What could be done?

The plant continued to investigate and experiment with different methods of finishing which could maintain reasonably good quality at better than moderate reductions in cost. Recent changes in methods have, for the time being, met this need.

Dipping provided a fast operation with less skilled help, a more economical utilization of material, and produced a good surface film with more uniform coating of all parts. At the same time, dipping eliminated warpage which had always been a serious problem not completely licked previously.

Boards dry for two hours in the conveyor before further handling. They are then removed by hand and stacked on trucks.

However, working out the technical details of an efficient dipping operation was far from easy. Actually, the plant felt for some time that some of the details might not quite get worked out.

The first dipping was done with a tank too large. Too much material was exposed to the air, so there was an immediate loss of solvent and shift in percentage of solids. The tank was built 2′ wide by 3′ long and 48″ deep. This was far larger than necessary to dip a single board the size of a card table top. And, on top of losing solvent, the sides of the sheet metal tank bulged out with the weight of so much material.

The dip tank was redesigned to present only 8″ x 30″ of surface exposed to the air which cut the solvent loss by 30% or more.

Proper design of a dip tank was only the beginning of problems. The next was an inherent feature of lacquer: drying too fast. The material would run, sag, and puddle, after which it would dry too rapidly and leave these ugly characteristics in the hard finish. There was a loss, too, of more than enough material for the basic film.

The rapid drying problem was not solved merely by changing the formula. A more successful solution came with the installation of a simple shield along the drip pan to retard evaporation. Later, a better arrangement was made with

Machine rubbing with a Sundstrand stroke sander, 240 grit silicon carbide paraffin base oil. Operation is primarily to smooth raised wood fibre and even up any film irregularity. Last detail of this operation is to wipe the rim with alcohol to remove oil and clean surface for adhesive which will hold rim felt in place.

a totally enclosed tunnel which trapped the solvent for sufficient drainage and flow out time. Parts were moved slowly through the tunnel from the dip tank and out into the open air of the drying room on an overhead chain conveyor.

Like a telescoped review of the company's history and the ups and downs of changing times, production problems popped up about as rapidly as others were solved. The next was a problem with workers.

Workers rebelled against working over the dip tank fumes. A girl would have to stand directly in front of the tank and suspend her face right over the open surface as she bent low to bring the large board completely below the lacquer level. The fumes were overwhelming.

A blower was devised to move the air away from the worker and into the drying tunnel, but this tended to defeat the purpose of the tunnel in retarding evaporation. Much engineering planning and considerable empirical testing had to be done to devise a small blower installation which barely moved the air over the tank, enough to keep the fumes away from the worker, but not so fast as to result in a significant loss of solvent in the tunnel.

Operator is inserting corner pockets. Fishnet pocket is held by wire clips in routed out groove in board. Wire points are hammered into wood at the corner.

At present the dipping operation is performed as follows: A girl dips all but the one corner by which she holds the board. Then she rotates the board, holding it by a wire hook to submerge the last corner. Next the board is hung by a hook to an overhead Chain-O-Flex conveyor.

There still were major problems with sags after everything else seemed to be under control. Many difficulties were encountered in testing different formulations of the lacquer to prevent sags and still retain other desired characteristics.

Neither cheaper nor more expensive materials seemed to work quite right. Finally, one of the suppliers did considerable research work in their own labs and at the Carrom plant to develop a special lacquer with proper solvents and solids content to make the finishing technique all that it was supposed to be.

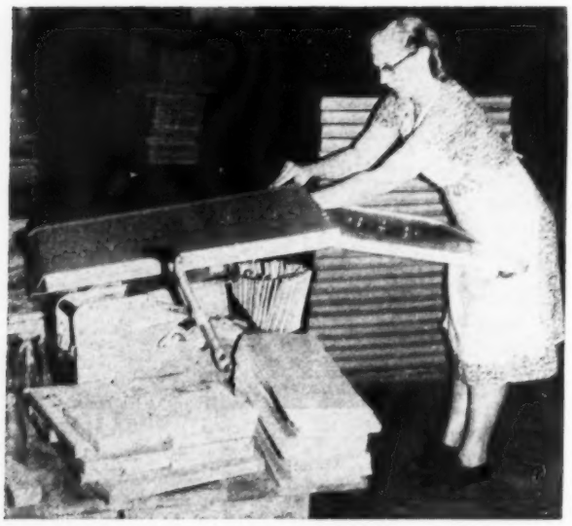
Even after the special material was developed, it had to be held very accurately to the designed viscosity of 21 seconds in a Zahn cup. It was found that steam heated coils wrapped around the outside of the dip tank, holding a fixed temperature of 80°F. was the only practical way of controlling viscosity as closely as was necessary. Then, finally, a good film was applied and no sags appeared on the dried surface.

This was the history of 69 years of progress in development of finishes for the Carrom board at the time of our recent visit. But, as time moves on, Bob Erickson, plant superintendent, does not believe he can stand pat on the successful de-

Gluing rim felt. Cement is applied from oil can which has lip formed to ride the rim.

Operator is installing crokinole pegs with screwdriver.

Some 80 pieces of equipment, which accompany each board, are being packaged at the "console." This packing bench is designed around motion economy principles. Parts come to operator through pipes and she can easily assemble all parts.



Packaging complete game board, cues and a small box of playing equipment. Carton is sealed with tape and carries a two-color printed advertising identification. This enables dealer to use box as a display in his store.

velopments to this point—at least, not for too long. He said that as our national economy continues to move in a way somewhat comparable to Napoleon's march across Europe and into Russia, it may not be too long before the entire dipping operation will have to be thrown out. It can eventually become just as expensive for modern finishing as three or four carefully brushed coats of varnish were a few decades ago. If so, what then?

Bob is already toying with other ideas to give an even better finish and reduce costs still further. At such a time, he expects to have a fully automated line which is impractical as yet because automation with dipping requires more space, much larger tank, and extensive special provisions against fire hazard.

Thus, the functional thinking at the operations level of Carrom Industries is filled with just as much purpose and imagination as was found in the mind of the man who first thought up the game in order to attract boys of his Sunday school class into the parlor and out of the pool room.

Clinics on Finger Jointing

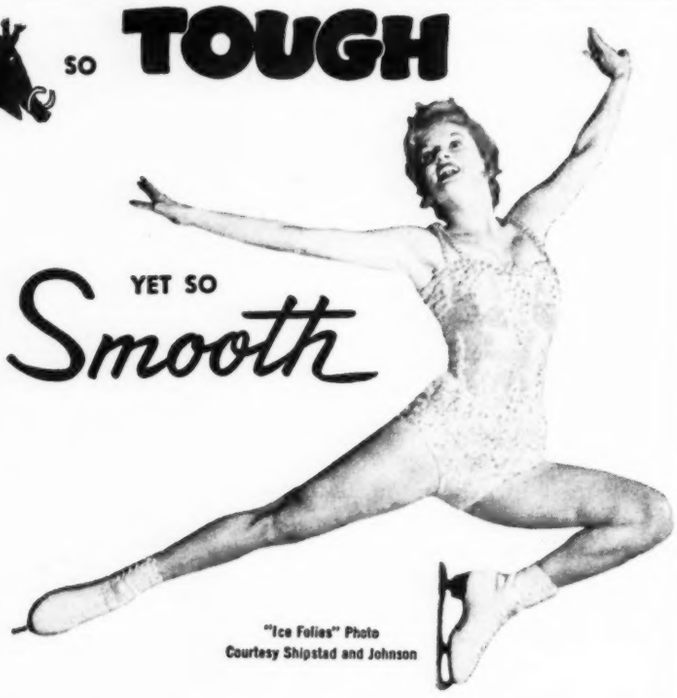
The Onsrud Machine Works is planning a series of clinics on the new woodworking method known as finger jointing. At this clinic the firm's new finger joint shaper and assembly machine will be introduced. In order to give woodworking manufacturers and others in allied fields a comprehensive picture of these new machines, Onsrud is beginning a program of regional and home office clinics where the economics of finger jointing will be presented in detail relative to a wide range of woodworking processing operations.

Typical case histories of applications will be detailed to show the actual savings and profits that can be derived from this method. In addition, actual machines will be demonstrated working on basic applications of finger joint shaping, gluing and assembling as for: moldings, flooring and reclaiming shorts for case goods interiors.

The first clinic was held early in November. A number of others are planned for early in 1959. Write to Onsrud Machine Works, Inc., Woodworking Machinery Div., 7742 Lehigh Ave., Niles 31, Ill., for information about clinics in your vicinity.

SO **TOUGH**

YET SO *Smooth*



"Ice Follies" Photo
Courtesy Shipstad and Johnson

NATIONAL NS SANDERS

National Sanders are built for TOUGH operation on busy production lines. As they are vibrationless, light weight, and easy to operate, they produce the *Smooth* surface so essential to a fine finish. For the woodworking industry National makes a complete line of electric or air driven sanders with straight-line or orbital action. Both single and double-pad air sanders are available. The popular Model 400 is shown below. Write for NEW folder today.

National Sanders

NATIONAL-DETROIT, INC.
ROCKFORD, ILLINOIS

Adjustments on Modern Machines

One interesting phase of modern woodworking equipment is the provision made for more sensitive adjustment. Adjustment screws are widely used, and should always work with greatest possible freedom. Free-working screws are necessary in order that sensitive adjustments may be obtained, but are also required so that manual adjustments may be made with a small amount of effort. In some instances, threads of adjustment screws gather dirt; this causes them to work stiffly.

Sometimes, gathering of dirt in adjustment screw threads may cause a high rate of screw wear. Nevertheless, there are many cases where adjustment screws cannot be completely covered. These inevitably gather dirt from the air and should have occasional cleaning. Using a brush with relatively fine but stiff bristles, in connection with kerosene, and revolving an adjustment screw through a small arc a few times between brushings, one can obtain a very good job of cleaning. The kerosene cuts any resin or pitch which may be present. Afterward, it may be helpful to rub a bit of graphite into the screw threads. Graphite is particularly suitable because it serves as a lubricant, and yet is dry. Being dry, it does not attract or retain dirt as will a dressing of machine oil.

One interesting method employed for maintaining clean screw threads consists in filing or cutting a groove directly across the crests of male threads on a screw, or straight across the crests of female threads in the nut or other device through which the screw passes. The interrupted threads have a sort of tapping action, making them self-cleaning, yet they are fully as efficient as before.

Adjusting Beds and Tables

Tables and beds on modern woodworking machines are easier to raise and lower than those on older models. Vertical lifting and lowering screws used are often equipped with thrust ball bearings at the lower end. This eliminates frictional drag which was formerly present. In addition, many modern pieces of woodworking equipment are provided with power elevating devices, where relatively-heavy machine members must be lifted. Planer beds, sander decks and beds, and other machine components are provided with power hoists. This greatly reduces the amount of manual effort needed for adjustment, and thereby lowers operator fatigue. It also speeds initial setting of a machine, keeping it in actual production a larger part of the time.

For Less Than $100!

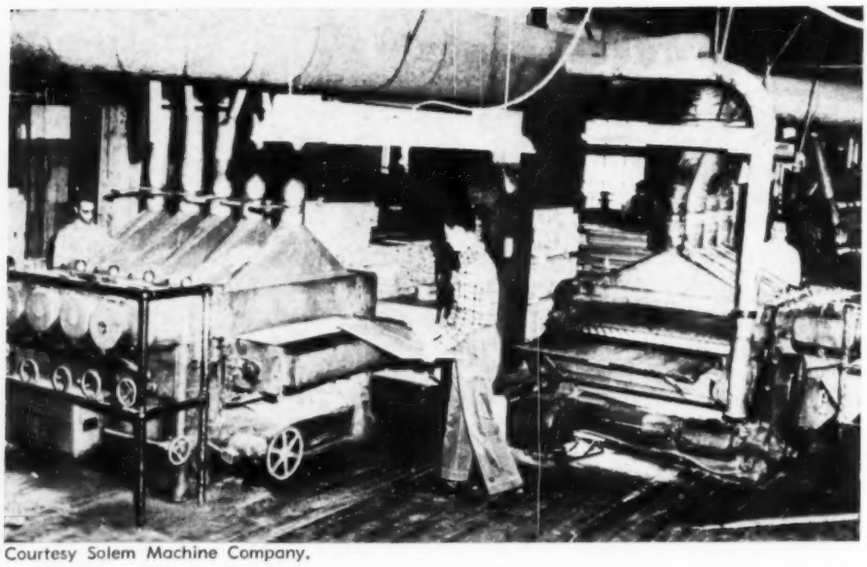
Absolutely in a class by itself! No other sander under $100 can compare with it.

The Porter-Cable model 564 belt sander really "hogs down" stock . . . its big 4" belt, backed by 22 sq. in. of cork and steel shoe, provides more capacity than you ever hoped for at this price. The low 7" frame adds to its better balance—makes it easy to handle. The full 9-amp. motor delivers the rugged all-day power you need.

This sander is packed with Porter-Cable quality and design features—one-knob tracking adjustment . . . rubber-nylon non-slip timing belt . . . precision ball and needle bearings throughout . . . special tensioning device for quick belt changes . . . extra-large vents for cooler operation. See your Porter-Cable dealer, or write to us for a demonstration.

PORTER-CABLE MACHINE CO.,
519-B Marcellus St., Syracuse 4, New York
In Canada: Write Porter-Cable Ltd.,
Box 5019, London, Ontario.
In Mexico: Write CIA General Distribuidora,
Ave. San Antonio Abad 236 Mexico City, D.F.

Porter-Cable
Quality Power Tools



Courtesy Solem Machine Company.

Two endless-bed drum sanders working in tandem in the plant of Jamestown Table Company, Salamanca, New York. Four handwheels, arranged in a row, used for sensitively adjusting the height of the four sanding drums, can be seen on the Solem machine in the left foreground; the ammeters are above their respective drum motors. Each of the four handwheel shafts is provided with a graduated dial at the point where it passes through the machine frame. Note how the unit has been guarded with a pipe-type guard, which nevertheless leaves everything sufficiently open to give ready access to the drum-adjusting handwheels.

Sensitivity in machine adjustment has become of increasing importance as greater accuracy has developed in machining wood products. This has lead, in many instances, to use of dials in connection with adjustment screws or shafts, as the case may be. One might cite many instances of the use of dials in connection with woodworking machine adjustment. Where employed, they allow an operator to make a very fine adjustment with full knowledge of the specific amount he is moving a component up or down, in or out.

Sometimes, a series of elements may be provided with dials, allowing exceptionally close control of relative amounts they are adjusted. An important instance in point is found on multiple-drum endless-bed sanders, as for instance machines made by Solem. On these, each drum is individually adjustable, and adjustment of each is quickly made by a conveniently-located handwheel. In connection with each handwheel shaft, an indicating dial accurately shows the amount the drum is being raised or lowered.

FAMOWOOD . . . *the AMAZING*

ALL-PURPOSE PLASTIC for wood finishes!

Applies like putty . . . Sticks like glue!

FAMOWOOD is the answer . . . where wood finishes are important. Simple to use . . . efficient, lasting, time-saving, when filling wood cracks, gouges, nail and screw holes or correcting defects. Dries quickly, does not shrink. *Stays put* under adverse conditions.

FAMOWOOD sands easily, does not gum up sander. *Takes spirit dye stains freely.* Waterproof and weatherproof when properly applied. Ready to use—"*right out of the can.*" Fifteen matching wood colors with matchless wood finishes.

USED BY . . . FURNITURE MFGS. • SASH AND DOOR MFGS. • CABINET MAKERS • CONTRACTORS • BOAT BUILDERS PAINTERS • AIRCRAFT PLANTS • PATTERN SHOPS • HOME BUILDERS • ALL WOOD PRODUCTS

FAMOWOOD descriptive literature and price list on request.

Distributor & Dealer inquiries invited, write Dept. 547

BEVERLY MANUFACTURING COMPANY

9118 SOUTH MAIN STREET • LOS ANGELES 3, CALIF.

Manufacturers of . . . FAMOWOOD • FAMOGLAZE • FAMOSOLVENT

Nutting

Most Complete Line of Floor Trucks in America

Figure 321—Lumber Buggy. Large wide tread wheels for outdoor as well as indoor use.

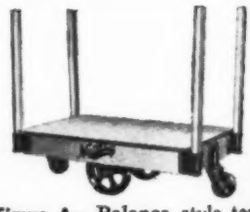


Figure A—Balance style for turning sharp corners. Variety of superstructures and wheel sizes.

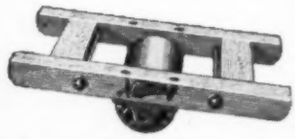


Figure 1191—Timber Dolly. Used as a dolly or, inverted as a portable roller.

Figure 2419 and 421—

Jack and Skid. Stores and transports materials with one-time handling . . . One Jack services many Skids.

WRITE FOR FREE LITERATURE

SINCE 1891

NUTTING TRUCK AND CASTER COMPANY

1122 Division Street • Faribault, Minnesota

Dial Team with Ammeters

In this particular case, there is a still further refinement in regard to knowledge of adjustment. The more of a specific drum is lowered on an endless-bed sander, for instance, the heavier is the cut it will make, and the greater will be the working load imposed on the drum motor. This actual working load of the motor can be visually indicated through use of an ammeter. By providing each drum motor on a four-drum machine with its individual ammeter, and comparing indications on the ammeters, relative loads being imposed on the sanding drums can be directly compared.

By this means, still more effective use can be made of the highly-sensitive adjustment made possible by the dial-fitted handwheel shaft. This means that on a four-drum machine, for instance, even though different drums carry different abrasive grit sizes, actual working motors loads can be compared. Each drum can therefore be meticulously set to carry its own predetermined part of the overall sanding load.

How to Install Laminates

Fabricators looking for ways to save time and labor on plastic laminate installations will find much useful information in a new manual just released by Pioneer Plastics Corp., Sanford, Maine.

Entitled, "On-the-Job Installation Data," this handy, pocket-sized booklet gives clear, step-by-step instructions for applying Pionite laminates on every vertical and horizontal surface. Actual photographs of frabricators at work show how to use hand and power tools effectively, the right way of applying contact cement, and rolling to make a perfect bond.

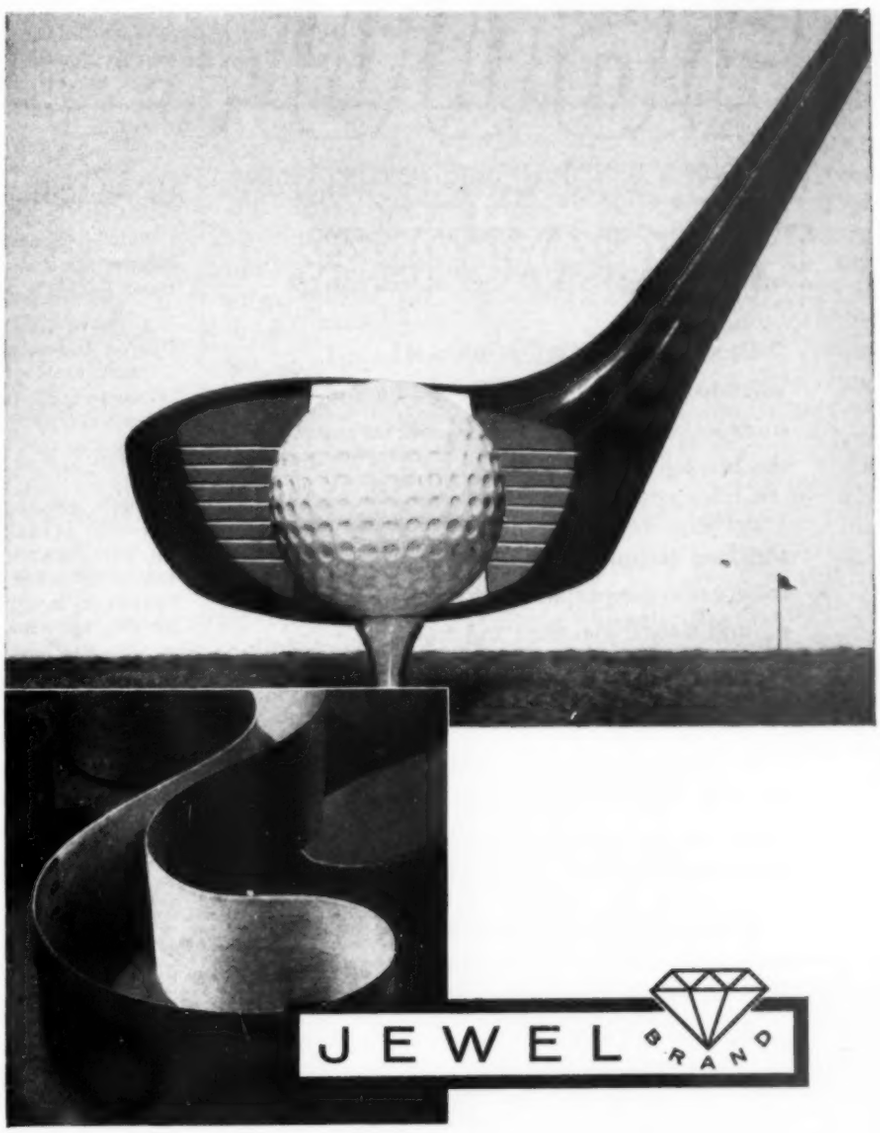
A special section on "Interesting Effects with Pionite" gives the fabricator useful information on helping the customer to plan an attractive installation. Photographs show how Pionite can be cut into planks or squares for unusual decorative effects for wall paneling or striking mural designs. The reader learns how to combine woodgrains and decorative patterns or solid colors pleasingly in countless ways.

Copies of "On-the-Job Installation Data" for Pionite laminates can be obtained by writing to Pioneer Plastics Corporation, Allen Street, Sanford, Maine.

Use postpaid card. Circle No. 5

For the finishing touch that means so much!

Whether you're polishing the head of a delicately balanced golf club or smoothing out the rough spots on a modern headboard, Jewel Brand Coated Abrasives ensure faster, finer finishing. On job after job, experience proves that **end products cost less when you finish with Jewel Brand Abrasives.** Prove it for yourself now, by bringing their many money-saving advantages to bear on your own finishing problems. Order from your Industrial Distributor or write for specific recommendations. Abrasive Products, Inc., 551 Pearl Street, South Braintree 85, Mass.



COATED ABRASIVES

Belts • Rolls • Sheets • Discs • Specialties

ABRASIVE PRODUCTS, INC.

South Braintree 85, Massachusetts

CRYSTAL CLEAR!

Daconite

5600

WATER WHITE

LACQUER

Daconite 5600 Water White Lacquer saves time and money on the production line, makes your product sell faster in the market.

A ready to spray clear lacquer, (Alkyd fortified) Daconite 5600 is recommended for use over blond stains, light fillers, light natural woods, Masonite and metal.

Daconite 5600 has excellent cold check resistance and produces a finish of exceptional paleness and color retention quality that will not ring from alcohol, water or hot dishes. It is highly resistant to scuffing and scratching.

5600 has been fully tested under actual market conditions. It has all the time and money saving features that assures you of production line economy as well as superior finished results.

Write for specifications sheet and testing samples on your letterhead

JAMES B. DAY & COMPANY

1872 CLYBOURN AVE., CHICAGO 14, ILL.

fine production finishes for industry since 1906

Trend Setting Wood Finishes

The Gilbert Spruance Company of Philadelphia, manufacturers of furniture finishes has just released the first volume in a series of trend setting "Wood Finish Originals" sample panels.

As each new volume featuring an unusual "Wood Finish Original" is released it can be added to those previously issued to form a furniture finish sample panel library. This service by Spruance is to provide fresh inspiration to furniture manufacturers and new dimensions of expression for designers and decorators. First in the series, "Fantasia," a medium brown oil finish created especially for semi-figured walnut veneer literally puts a new gleam in walnut—rich, elegant, so fine it accentuates even the most delicate tracing in the grain. This and every Spruance finish must pass strict laboratory standards as well as consumer testing.

Sample panels are encased in attractive folder-covers with cut-out design for easy reference. Numbered clearly on the side they measure 8½" x 5¾". Complete information on wood and finish is included.

Those interested in receiving panels as they are prepared may write to the Gilbert Spruance Company, Richmond and Tioga Streets, Philadelphia, Pa.

Use postpaid card. Circle No. 12

Univac Data Processing Described

A new three-color folder entitled, "The New Concept in Modern Data-Processing," has been released by Remington Rand Division of Sperry Rand Corporation.

A quick summary of the components and values of the Univac file-computer system, Model 1, the folder contains a description in non-technical terms of the instantaneous random access feature as it applies to typical busniess applications. These may include inventory control, sales analysis, billing, payroll, cost control, labor distribution, production control and other data processing applications.

The eight pages enumerate specific storage (internal memory) capacities, and give the average rates of speed in the performance of each arithmetical process. Addition and subtraction, for example, are given as 66,000 per minute. Speeds for multiplication, division, and alpha-numerical comparison are also listed.

Use of the system, either for on-line or off-line, is described along with specifics of speeds, capacities and operational facts covering the inquiry unit, magnetic tape units, the sensing-punching units and the high-speed printer.

Copies of the folder (U1483) are available by writing Remington Rand, 315 Fourth Avenue, New York 10, N.Y.

Use postpaid card Circle No. 13

Wood Cabinet Booklet

A newly published 8-page booklet on the advantages of factory-engineered wood kitchen cabinets may be obtained by writing the National Institute of Wood Kitchens, 75 E. Wacker Drive, Chicago 1, Ill. Directed to builders and homemakers, the booklet cites ten reasons for specifying factory-engineered wood cabinets.

"With nine out of ten builders and homemakers preferring wood for kitchen cabinets," says an institute spokesman, "there is a need today to distinguish between factory-engineered cabinets and those built on the job."

"Wood cabinets built on the job-site," she said, "frequently are crudely put together of inferior materials and assembled without sufficient regard for good design and construction. Factory-engineered cabinets, on the other hand, are made from select uniform materials by skilled craftsmen under controlled conditions and delivered to the job ready for quick installation."

Use postaid card. Circle No. 14

around the shop

This monthly feature answers readers' questions on common shop problems. If you wish to present a problem, or desire further discussion of problems discussed here, write to the Editor.

Are The Cauls To Blame?

We are having trouble with pre-cure in our figured plywood but not with our plain plywood, despite the fact that glue spread and hot pressing cycles for both types are exactly the same. The only difference in handling is the use of aluminum cauls to protect figured veneers in the hot press. These are not used with plain veneers. Can you suggest a possible source of our trouble?

It would seem to be rather obvious that the most probable source of your trouble lies in the use of aluminum cauls. While you have not stated it to be so, it would appear that these cauls are not being properly cooled before being used again and the heat picked up in the hot press operates to pre-cure the veneer glue spread before the plywood layup is put under pressure in the press. These aluminum cauls should be cooled after unloading from the hot press before using them for the new press charge.

The problem might be solved by the provision of spare sets of cauls, so that one set could be cooling while the other set is in the press. A more economical remedy would be to place the aluminum cauls into a rack, as they are unloaded from the hot press, and circulate cool air through them by means of a fan. A minimum space of about 3" between cauls has proved to be effective for cooling purposes in many plants. The fan should be sufficiently large to provide adequate coverage of the rack and circulation of air for rapid cooling.

Tie Specifications

During a recent discussion with a railroad representative on the possibilities of supplying railroad ties, he made reference to class "U" and class "T" ties but offered no further explanation. To what was he referring?

Class designation "U" and "T" in railroad tie specifications generally apply to preservative requirements, with Class "U" species not requiring preservative treatment and Class "T" requiring this treatment. Included in the Class "U" designations are such species as: catalpa, cedar, chestnut, cypress, Douglas fir and pine heart, black locust, red mulberry, white oak, redwood, sassafras and black walnut. Class "T" species include: ash, beech, birch, butternut, cedar sapwood, cypress, cherry, elm, gumwood, Douglas fir and pine, hackberry, hemlock, hickory, larch, honey locust, red oak and spruce.

How To Control Bugs

We are bothered by powder post beetle attack on basswood and hickory lumber in storage piles in our yard. What can we do to control these bug attacks?

Kiln drying this lumber at temperatures of 125°F. or higher for sustained periods will kill all insects of this type in the wood but contributes nothing to protection against future attacks. An entomology expert advises that chemical controls could furnish protection against powder post beetle attack. He recommends the use of a 5% solution of pentachlorophenol in a fuel oil, or a hot (about 180°F.) 5% water solution of borax, or a 5% DDT solution in a fuel oil, or pine oil in fuel oil.

Which Wood Is Best?

In a discussion of species best suited for use as fence posts, I took issue with the speaker who stated that osage orange had the longest life expectancy, untreated, in contact with the soil. I say black locust has a longer life as a post. Which of us is correct?

Reports of exhaustive tests of various species made to determine their life expectancy as posts in contact with the soil, showed black locust and osage orange life expectancy of 20 to 25 years—both the same. You might be interested to know that other woods showing the same rating where mulberry and redwood.

What Is This?

What is Statistical Quality Control?

An expert in the field states that the science of statistical quality

control is the application of theory of mathematical statistics to problems in the manufacture of products which have the dominant factor of variation to study and control variation in those properties which are capable of being controlled. Its practice provides timely indications of quality lag or deterioration in time to apply preventative measures before too much damage can be done.

How To Control Bugs

How much chemical is required for fire-proofing wood as compared to the volume needed in preservative treating against insect attack, fungi and decay? Does fire-proofing treatment provide any protection against insects and fungi?

The preservative authority to whom this problem was referred advises that a cubic foot of wood requires from 2 to 12 times the volume of chemical for fire-proofing than is required in preservative treatment for protection against insects, fungi and decay. He also states that when wood is given proper fire-proofing treatment, the chemicals used in this treatment are usually toxic to fungi and insects. The degree of protection provided by fire-proofing treatment is generally more than that provided by the standard salt type preservative treatment.

Impregnated Laboratory Furniture

A distributor who is negotiating with us to produce laboratory furniture specifies that wood used must be impregnated to increase chemical resistance. What material is used for this impregnation and how is it applied?

A concern which has been very successful in this specialized furniture field for many years impregnated the wood deeply in a conventional pressure cylinder (as used for preservative treatment) with a water soluble phenol-formaldehyde resin, with a resin weight of about 30% of the wood weight. After impregnation, the resin is set under relatively high temperatures, ranging from 200° to 300°F.

Who Is To Blame?

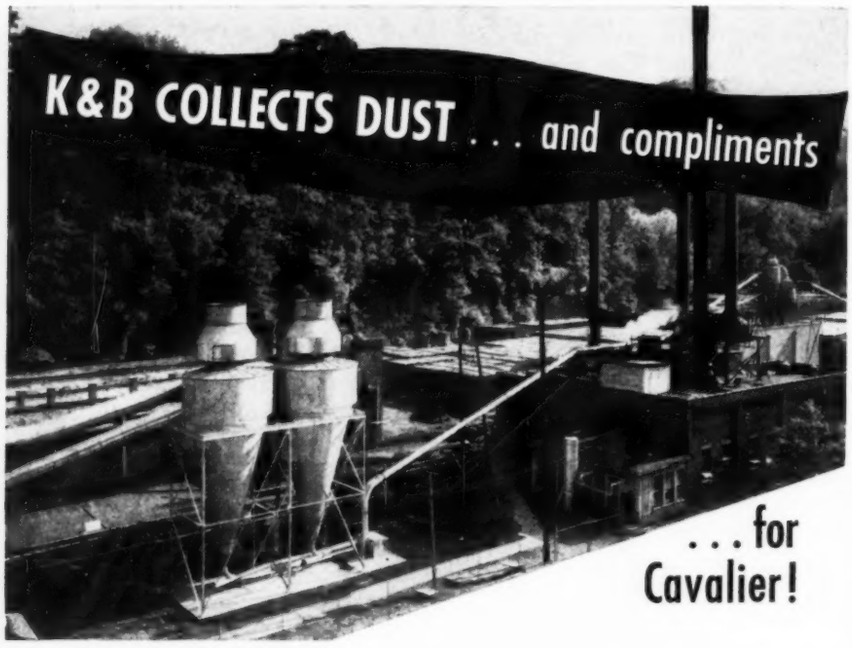
Our peeler lathe operator has considerable trouble with bent knives. He blames the knives, but they are the same knives other operators have used without experiencing this trouble. Can you suggest any check points which might disclose the cause of this lathe knife bending?

There are many things which could bend the lathe knife.. One of the most common is running the knife too close to the chucks. Your operator may also try to round up his logs faster by performing a slabbing operation. If he increases the infeed excessively and throws back the pressure cap, the knife will not have adequate support and knife bending can result. Many times small pieces of wood, called "rubbers by many operators, stick to the knife and ride between the peeler block and knife edge during the veneer cutting operation to put sufficient strain on the knife to bend it.

How To Spot Sand

We use portable sanders for final clean-up sanding of all flat surfaces but have difficulty using these sanders where spot sanding is required. Is there any equipment available which would permit doing this to eliminate expensive hand sanding?

Some portable sanders are equipped with a special "hump"



Kirk & Blum Design 3 Collectors

The Cavalier Corporation, Chattanooga, Tenn., quality furniture manufacturers, realize that clean air pleases people both inside and *outside* the plant.

To make a clean sweep of their dust collecting problems, they called in K & B. The result . . . a streamlined, efficient installation . . . and compliments on cleanliness from neighbors nearby.

Put "Clean Air, The Invisible Tool" to work for you. Contact Kirk & Blum today for a completely integrated dust control system, from design thru fabrication and installation.

The KIRK & BLUM Manufacturing Co.
3121 Forrer Street **Cincinnati 9, Ohio**

KIRK & BLUM DUST CONTROL SYSTEMS

shoe designed especially for applications of this kind. It permits a portion of the backing plate to be expanded to permit spot sanding and then retracted to its original flat position for conventional sanding. special shoes are also available for sanding curved or irregular surfaces without digging in.

Can We Do Our Own Grinding?

We are investigating the possibility of servicing our carbide tipped tools in our own plant. Can you advise what types of major grinding equipment would be required and how they would be used?

The two major grinding or sharpening machines found in most plants for maintenance of carbide tipped tools are a standard head grinder and a universal tool and cutter precision grinder. The head grinder is usually used for face grinding. The tool and cutter grinder is used to top off and grind the alternate top bevel (where required) and to dress for side clearance.

How To Finish Oak

We have little trouble finishing any wood except oak. Oak gives us plenty of trouble, chiefly in the form of poor color uniformity. What causes this condition and what is the best way to cure it?

The chief reason for trouble in color variations when finishing oak is due primarily to the natural acid condition of oak. If this is not effectively neutralized, the acid reacts after the stain and/or filler is applied to cause color variations. Neutralizing at best is rather unsatisfactory and expensive. Most finishers prefer to let the color variations occur where they may and tone them up after the filling operation rather than trying to completely neutralize the acid.

What Is Dew Point?

I recently attended a lecture on kiln drying in which the speaker made a number of references to dew point, but failed to explain its meaning. Just what is dew point?

Dew point simply explained is the temperature at which complete saturation is obtained. When temperature is lowered after the dew point has been reached, the excess moisture condenses or as some of the boys say, it drops out. In relation to kiln drying, no further evaporation can take place, or no more moisture can exist in the air as a vapor, at dew point without a rise in temperature.

Decar Brochure

A new, colorful 16-page brochure offered by the Decar Plastic Corporation shows the advantages of Decar "One Package Plastic Top Service" for furniture manufacturers.

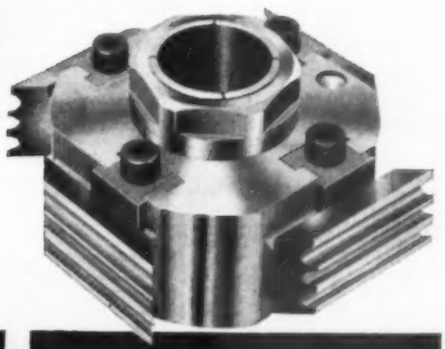
The new brochure pictures the way Decar "One Package" custom top service offers furniture manufacturers the advantages of a big, modern mass-production plant with high-speed fabrication facilities for plastic laminates.

The new brochure also spotlights Decar's complete line of Decarlite plastic laminates in a wide choice of natural wood grains and decorative patterns available in four basic types, Decarlite, Decaflex, Super Decaboard and Decaform.

Copies of this new Decar brochure "One Package Plastic Top Service" may be obtained by writing to the Decar Plastic Corporation, 1212 N. Central Park Avenue, Chicago 51, Illinois.

Use postpaid card. Circle No. 15

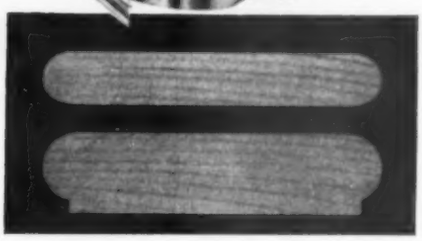
BADGER



BADGER CLAMP-T-SLOT CUTTERHEADS . . . Give

LONG

Production Runs with PRECISION THAT MAKES PARTS FIT!



While louvre door slats are of a simple design, they must be machined accurately to their true shape to properly fit into the routed grooves in the door stiles. If the machining is not precise, the slats are either difficult to assemble (increasing assembly time) or else they leave unsightly gaps (lowering product quality).

For the most part, slats are made from edgings that may contain knots, crooked or cross grain. Tear outs were a problem with much wasted material until the job was taken over with BADGER Clamp-T-Slot Cutterheads. These heads with milled-to-pattern bits, having the proper cutting angle, solved not only the tear-out problem but improved quality because the slats fitted precisely into the grooves during assembly.

The production requirement called for about twice as many of the simple rounded slats as those with the sharp shoulder. The pair of heads shown rounded two edges of one slat at a time. When one set of grooves in the bits becomes dull, the heads are moved up or down to place the next sharp grooves into cutting position. Thus three runs are made before the heads come off for sharpening.

When BADGER Engineers design your cutterheads, they give you the quality, the **precision** you want in your product together with high **quantity** output. Send your sketches and machine information **on to WISCONSIN** for some helpful engineering suggestions.

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SEND FOR *Free* CLAMP-T-SLOT CUTTERHEADS BULLETIN #200

Engineers to the Woodworking Industry

NAME_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____

WISCONSIN KNIFE WORKS

BELOIT, WISCONSIN

A roundup of day to day in-plant problems and how they were handled by management men. Each incident is taken from a true-life grievance which went to arbitration. Names of some principals involved have been changed for obvious reasons. Readers who want the source of any of these cases may write to Hitchcock's WOOD WORKING.

Can you fire a worker for shooting his wife?

What Happened

As happened so often, Bob Jones and his wife were having a family argument. Finally Bob yelled, "I've had all I can stand." With that remark he ran upstairs, grabbed his 32 calibre pistol and fired two shots in the ground where his wife was standing. One of the shots grazed Mrs. Jones. She was taken to the hospital where she remained for a couple of days. Jones was arrested on suspicion of assault with intent to kill, but there were no complaining witnesses at the hearing and the charge was dropped.

The following week Jones showed up for work. He drove a truck and had been on the job for 19 years. The company decided to fire Jones for the following reasons:

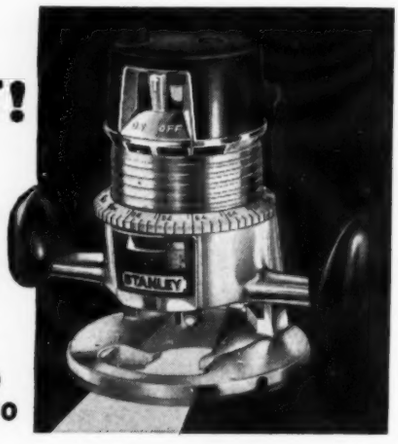
- We did not fire Jones because of the shooting incident. We discharged him because his behaviour revealed that he cannot control his emotions. Who knows–he might ram our truck into the side of a building one day.
- The shooting received a lot of publicity. Our employees knew about it and so did our customers. Jones has to meet with customers and his unsocial behaviour might reflect on our reputation.
- If Jones cannot control his temper he is probably accident-prone, and we can't take any chances.

Jones replied:

NEW!

Router with the light!

⅞ HP: $62.50
1¼ HP: $82.50



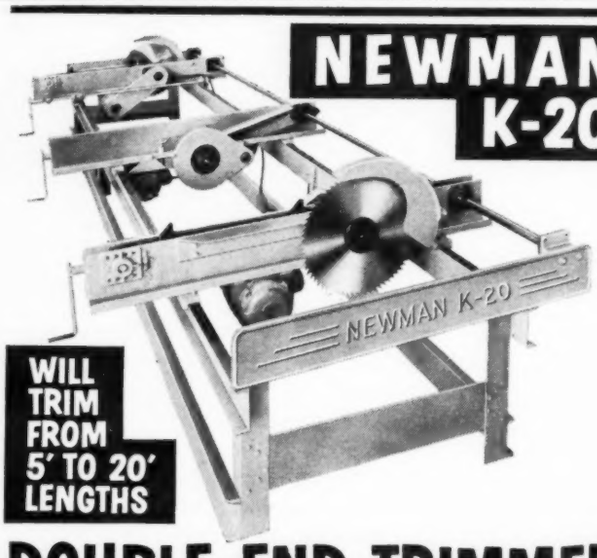
Here's the newest, most advanced router you will see for years to come.

- **RECESSED SAFETY SWITCH** locks shaft automatically.
- **MICRO-DEPTH ADJUSTMENT** for settings as fine as 4/1000 of an inch.
- **COMFORTABLE 3-POSITION HANDLES** for perfect stability, control.
- **UNIQUE SPOTLIGHT** throws bright beam on work area.

Also available, new builders kit, power planes and attachments. See your supplier today or write for free catalog to: Stanley Electric Tools, 79-D Myrtle St., New Britain, Connecticut.

STANLEY

NEWMAN K-20



WILL TRIM FROM 5' TO 20' LENGTHS

DOUBLE END TRIMMER

Either saw unit may be left stationary while the other saw unit is moved. Accuracy of 1/32" or better can be maintained. Individual V-belt drive to each saw arbor. Variable feed with speeds from 20 to 60 cuts per minute. Saws are standard 22" diameter and can be changed in a few seconds. Special saw collars available. Write today.

NEWMAN MACHINE CO. INC.
Greensboro, North Carolina, U. S. A.

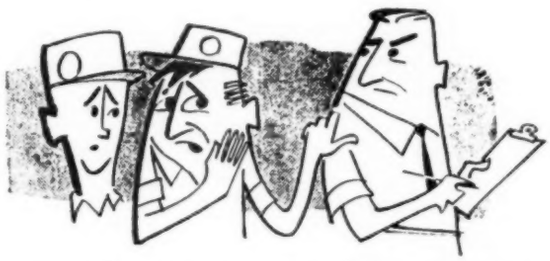
● What about my 19-year record of good work? There are lots of emotional strains to driving a truck, and yet I never had any trouble.

● The shooting is a domestic affair and has nothing to do with our employment relationship.

Was the Company: Right ☐ Wrong ☐

What Arbitrator L. C. Brown Ruled

"We cannot disregard the fact that Jones, for 19 years in an occupation which is subject to constant irritations, has given no evidence of an ungovernable temper or emotional instability. If signs of emotional instability appear, the company should be able to take the steps which seem to be required. Also, if Jones loses his acceptability to customers, the company will then have concrete evidence rather than speculation upon which to base a decision. Jones should be reinstated."



Can a worker be disciplined for criticizing his foreman?

What Happened

Ralph Taft was the best worker in the department. He knew his stuff—and what's more, he had 20 years of service. But Ralph didn't think much of his immediate boss. So in the locker room, and even on the job itself, Ralph criticized his superior. The supervisor got wind of Ralph's none-too-fond opinion, and the two men had a good talk.

Ralph agreed to curb his tongue. But he didn't do so—and he was given a two-week layoff. Ralph talked up in protest, and when his grievance came before an arbitrator, his contention was:

● Sure I criticized my supervisor, but I was exercising my right of free speech. People criticize the President of the United States every day, but they don't get disciplined.

● A disciplinary layoff should be for poor work. Look at my record—the best in the department. I want the two weeks' pay I lost.

The company had something to say about all this:

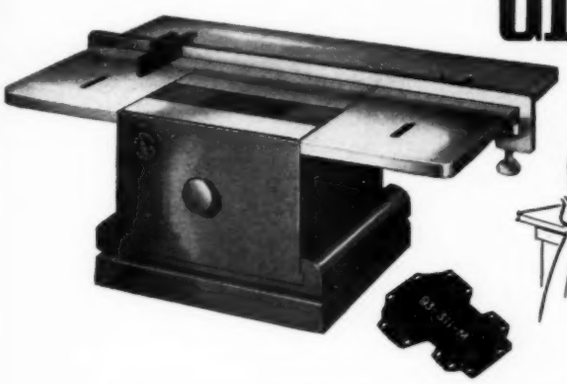
● A company is a place for work—not speechmaking.

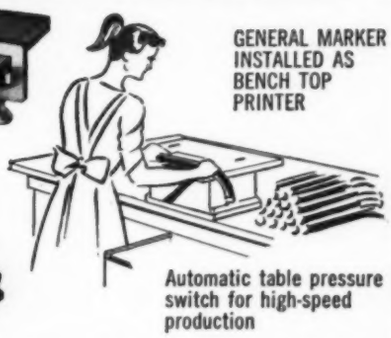
● Ralph's criticism of his supervisor created bad morale in the department, and lowered the status of the boss.

● Ralph was guilty of insubordination and deserved even more than he got. We were too lenient with him. He should have been fired.

MARKING PROBLEMS?

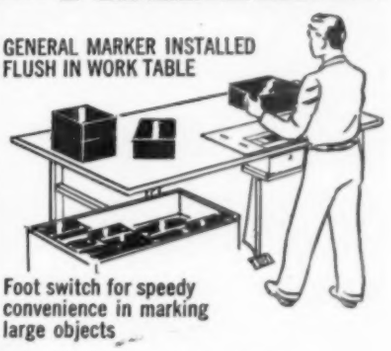
GENERAL SILK SCREEN MARKER





GENERAL MARKER INSTALLED AS BENCH TOP PRINTER

Automatic table pressure switch for high-speed production



GENERAL MARKER INSTALLED FLUSH IN WORK TABLE

Foot switch for speedy convenience in marking large objects

CLEAR, PERMANENT MARKINGS AT PRODUCTION LINE SPEEDS!

- Trade marks, part numbers, patent numbers, instructions, etc. . . printed up to 2500 markings per hour.
- Installs in work table or on bench top . . . mechanism below printing screen . . . leaves unobstructed work space.
- Always ready . . . no washup between work periods . . . enclosed fountain prevents ink drying.
- Quick change screens eliminate delays.
- Prints on rubber, wood, metal, glass, paper, plastic, fibreboard, leather . . . inks available for all surfaces.
- Ruggedly built . . . yet the COST IS AMAZINGLY LOW!

WRITE FOR COMPLETE INFORMATION ABOUT THE GENERAL MARKER AND SPECIAL MARKING INKS!

General Research and Supply Company

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You asked for it . . .

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TWO NEW AIR-OPERATED CLAMPS with 800 pound clamping force

AO-800 CLAMP

AODT-800
DOUBLE TOGGLE CLAMP

Because you asked for it, Lapeer's vast line of Knu-Vise clamps now features four distinct groups of air-operated clamps. Two new 800 lb. air clamps have been added to the widely accepted 200, 400 and 1200 lb. air clamps, thereby rounding out the Knu-Vise series. The Model AO-800 clamp is for conventional holding operations—the Model AODT-800 for those difficult mounting situations.

For complete information on these units and the more than 150 other models available, write for catalog today!

Manufacturers of over 150 models of manually and air-operated clamps and pliers

KNU-VISE PRODUCTS **LAPEER MANUFACTURING CO.**

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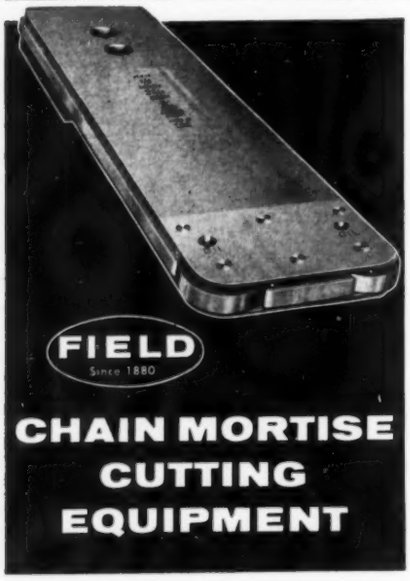

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For Blind or Extremely Long Mortises

We stock over 150 sizes of both double and single-bearing Guide Bars, Mortise Chains and Sprockets.

Our quality equipment and interchangeable replacement parts insure maximum mortising production for your plant.

WILLIAM H. FIELD CO., INC.

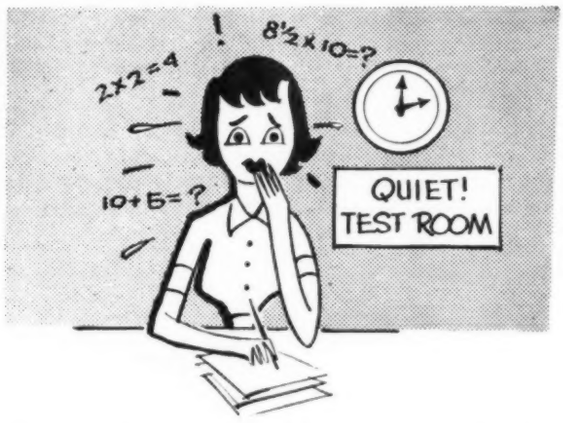
SINCE 1880

332 Dorchester Ave., Boston 27, Mass.

Was the Company: Right ☐ Wrong ☐

What Arbitrator H. J. Dworkin Said

"Freedom of speech and expression are reserved as the right of every individual by our way of life in a democracy. These cannot be denied. However, where improper conversation regarding supervision and the company occurs *on the job*, this is tantamount to insubordination, and a remedy is justified. The company's action is sustained."



Can you use a test to deny a promotion to an employee?

What Happened

When a job opened up in the shipping department, Alice Newmark felt sure she would get the promotion because the company had a policy of promoting from within on the basis of "seniority and job requirements." But when she made formal application, the supervisor told her that she would have to take a test in arithmetic because the job called for "ability to do simple calculation."

"Do you always give a test for this job?" asked Alice.

"Yes, we do, Alice," replied the supervisor. "But you shouldn't have any trouble. You've done some temporary work on this job before."

Alice took the test, and failed. The job was given to a junior employee. Alice complained:

- I know the work on that job. I filled in many times and made out all right.
- I want a chance to prove myself on the job. I'm entitled to a trial period.

The company sympathized with Alice's situation, but felt it couldn't change the rules to fit one employee. It had always given a test for that job, and had used the results exclusively to decide who was to be promoted. No one had ever before complained about the test.

Was the Company: Right ☐ Wrong ☐

What Arbitrator M. S. Boothe Ruled

"The crux of the case is whether the company had the right to deny the grievant the job solely by reason of her failure to pass an examination testing her proficiency in simple mathematics. The use of tests is properly a supplement to other personnel

evaluation tools and techniques. Thus, the test should not be used alone as a means for evaluating the employee unless such a condition is specifically spelled out in company policy. In this case, it is not.

The policy of the company does not include 'ability to pass a test' as a requirement, but merely 'seniority and requirements for the job.' The employee should be given a trial in the job—particularly where the company is safe-guarded through the probationary period. Also, if the employee doesn't make the grade on the job, the test results will be strong evidence in favor of the company's judgment. Alice Newmark should be promoted on a trial basis."

Ply-Veneer Specifications Folder

The Silvatek Products Div. of Weyerhaeuser Timber Company has released to the trade a new specifications folder on Ply-Veneer, the company's panel product made of a distended Douglas fir veneer core, laminated top and bottom with heavy kraft liner board. The folder provides laboratory-documented tables of physical characteristics of Ply-Veneer and gives complete specifications on the wide range of surface variations, thicknesses and sizes available. The adaptability of Ply-Veneer to modern high-speed production tools and techniques is illustrated with photographs showing use in the packaging, luggage and furniture industries.

Copies are available from Silvatek Products Division, Weyerhaeuser Timber Company, Tacoma, Washington.

Use postpaid card. Circle No. 16

Edmont Case No. 625: For spraying and glueing furniture, Edmont recommended a super flexible plastic coated glove (No. 412 Snorkel). It outwore the rubber glove previously used 3 to 1 and provided greater dexterity.

Outwear rubber gloves 3 to 1

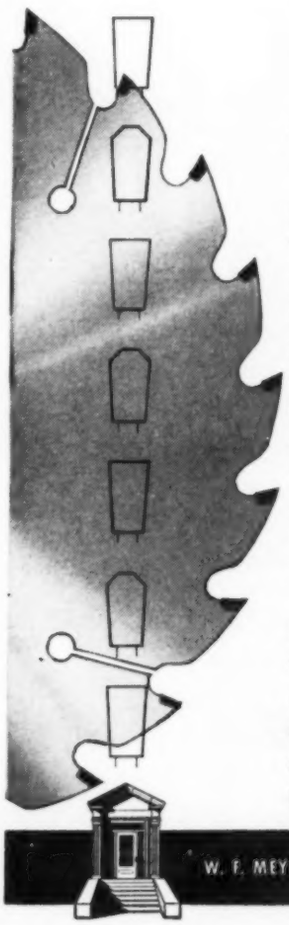
No. 412
12" fully coated gauntlet

In case above, the Edmont-recommended glove wore 3 times longer, and reduced glove costs, because it fit the job. Its vinyl coating has an outstanding wet grip and excellent resistance to abrasion and snagging. Its 2-piece jersey liner, wing thumb and curved fingers provide unequalled flexibility, hand freedom and comfort.

Free Test Offer To Listed Firms: Describe your operation, materials handled, temperature condition. From more than 50 Edmont types, we will recommend the glove that fits your job and supply samples for on-the-job testing.

Edmont JOB-FITTED GLOVES

Edmont Manufacturing Company
1246 Walnut Street, Coshocton, Ohio
In Canada write MSA, Toronto



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CARBIDE TIPPED SAWS

MEYCO MAINLINE carbide tipped saws with the *Uni-Chip* grind (alternating double-bevel and raker teeth) are the *Best* you can buy. Your results will be *Better*, because every tip is *Superhoned for Super Sharpness* . . . giving you the finest cuts and longer life . . . truly quality saws at prices you can afford.

MAINLINE is the complete line, a saw for every purpose, 6" to 16" diameters with different numbers of teeth. Remember—all **MEYCO** saws are *Satisfaction Guaranteed.*

Write today for catalog No. 64

W. F. MEYERS CO., INC., BEDFORD, INDIANA

Greenlee offers a complete assortment of Machine Bits

TOOLS FOR CRAFTSMEN
GREENLEE

Hard wood, soft wood, end grain or cross grain. Greenlee has a complete assortment of long-lasting, alloy machine bits to meet your every need. Investigate today!

See your nearest Greenlee distributor or write for your copy of catalog 36-M.

WOODWORKING MACHINERY MANUFACTURERS ASSOCIATION

GREENLEE
TOOL CO.
Division of Greenlee Bros. & Co.
2142 HERBERT AVE.
ROCKFORD, ILLINOIS

Maley & Wertz Modernization Program

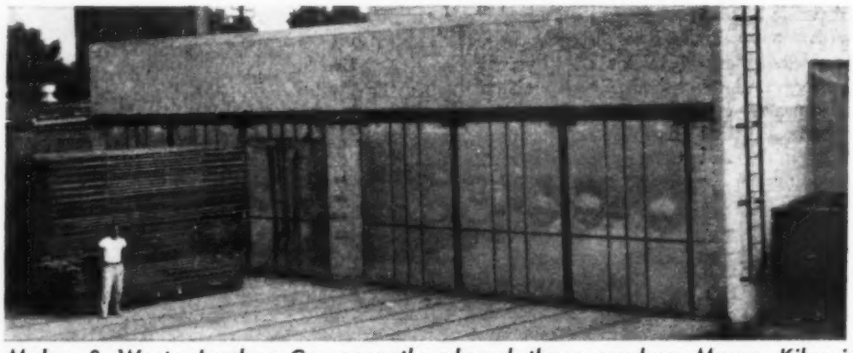
After half a century operation as one of the pioneer manufacturers of Indiana hardwoods, Maley & Wertz Lumber Co., Evansville, Ind., has converted its operations into an efficient concentration yard, and added modern custom drying facilites.

The latest addition includes two Moore cross-circulation kilns, having combined drying capacity of 200,000 to 250,000 board feet of lumber per month. To provide accurate control over the drying elements—so necessary in custom drying where many different species and thicknesses may be involved—each kiln is equipped with a Moore master recorder-controller. This dry kiln instrument automatically controls and records drying elements according to predetermined schedules, and provides thermostatic control over roof ventilation.

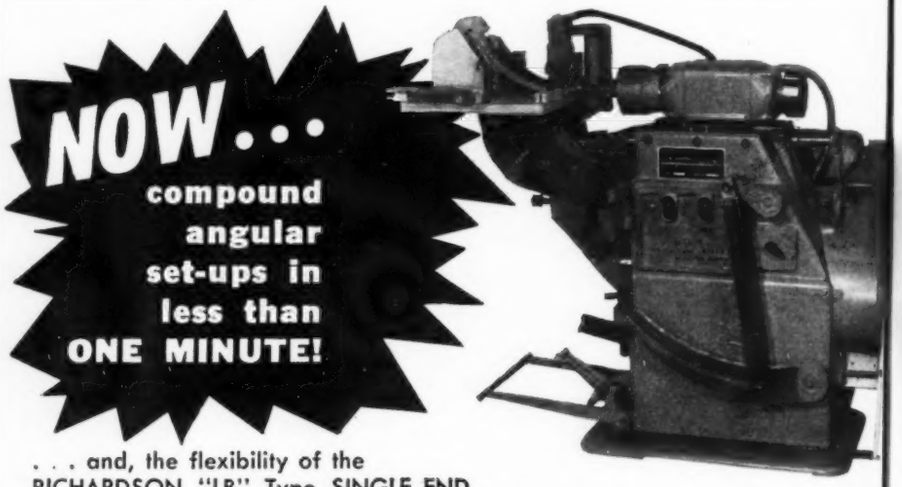
Heat for the kilns is provided by an Amesteam generator, which utilizes natural gas for fuel. A large concrete warehouse has been constructed next to the kiln buildings, giving a heated storage area for holding up to 550,000 feet of lumber.

Maley & Wertz Lumber Co. is able to handle custom kiln drying on a through transit basis, and has installed dressing and resawing facilities adjacent to the kiln area.

Although the Maley & Wertz firm began operations as a partnership in 1901, founder Daniel Wertz first began cutting Indiana hardwoods in 1884, and established his first sawmill with the late Bedna Young in 1890. Daniel Wertz' son, Claude Wertz, Sr., is president of the company today, assisted by his son Claude Jr., vice president.



Maley & Wertz Lumber Co. recently placed these modern Moore Kilns in operation at their Evansville, Ind., plant.



. . . and, the flexibility of the
RICHARDSON "LB" Type SINGLE END,
COMPOUND ANGULAR, TRIMMING, CHUCKING, BORING MACHINE
makes it the world's biggest value in the field.

With feed rates up to 30 pieces per minute and set-ups in less than one minute, the RICHARDSON "LB" will certainly prove to be a worthy member in your production line. Small lots which would not warrant a double end setup are run efficiently on the "LB". *Send for complete information and specifications, right away, without obligation.*

J. S. RICHARDSON COMPANY
ENGINEERS & MANUFACTURERS OF HIGH SPEED PRODUCTION EQUIPMENT
SHEBOYGAN FALLS, WIS.

In addition to the efficient layout for handling custom kiln drying and milling, Maley & Wertz Lumber Co. maintains a large inventory of hardwoods, shipping from 7½ to 10 million feet of lumber annually.

The Maley & Wertz mills were one of the pioneer cutters of Indiana quartered white oak, which was shipped all over the world. With the gradual disappearance of this timber, the company has shifted to the production of plain sawn red oak, soft maple—WHAD and WHND—tough textured white ash, cottonwood, sycamore, soft elm, hackberry and pecan.

Maley & Wertz Lumber Co. gets nearly all its green lumber from the tri-state area, buying on a contract basis which includes certain types of financing for portable mill operations.

New 70-Page Plastiglide Catalog

A new 70-page catalog issued by Plastiglide Manufacturing Corporation is now available to the furniture manufacturer. The catalog is a deluxe presentation of the complete Plastiglide line and includes thousands of stock parts listings of such items as swivel glides, plastic glides, metal ferrules, extruded parts for furniture and both metal and plastic furniture hardware.

The swivel glide section is a completely new presentation not previously listed in catalog form. There are many new designs of all-plastic swivel glides, metal ferrule swivel glides both straight and tapered, and both nail-on and screw-on types of swivel glides.

The furniture hardware section represents one of the fastest growing divisions of the company. There are complete lines of straight, tapered, spring and custom ferrules, bumpers, spacers, washers, rollers, wheels and bearings as well as many specialized parts such as flush finger pulls, glass clips, extension table dowel pins, etc. The catalog is unique in its completeness and diversification of products.

Write on your company letterhead to Plastiglide Manufacturing Corporation, 1757 Stanford Street, Santa Monica, California and request "Plastiglide Catalog No. 5."

Use postpaid card. Circle No. 17

Semi-chemical Pulps

This report summarizes the results of the pulping of mockernut, pignut, sand and shagbark hickory, which are plentiful in some parts of the eastern United States.

Ask for Report No. 2088 "Papers and Boards from Hickory Neutral Sulfite Semi-chemical Pulps" from U. S. Forest Products Laboratory, Madison 5, Wis-

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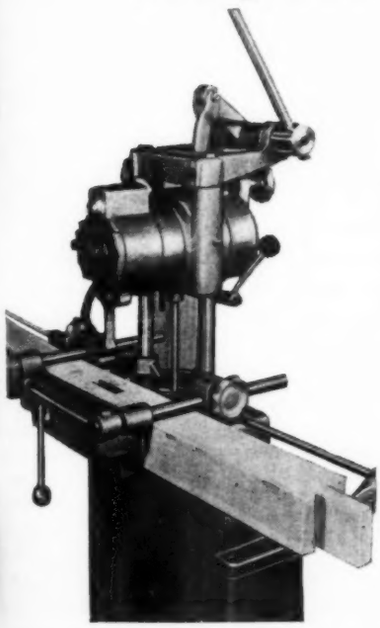
MORTISING DONE the easy Haller-Maka way...



REVOLUTIONARY APPROACH TO MORTISING THE WIDEST VARIETY OF HOLES.

- EASY CHIP REMOVAL
- CLEAN SHARP CORNERS
- PRACTICALLY FLAT BOTTOM

AVAILABLE IN SINGLE STATION OR MULTIPLE HEAD MODELS.

MANY TERRITORIES NOW AVAILABLE FOR DEALERS INTERESTED IN SOMETHING REALLY NEW.

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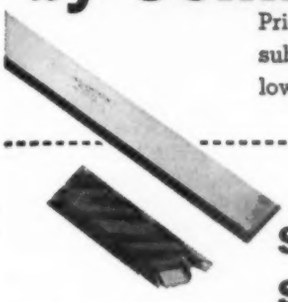
NORTHVILLE, MICHIGAN

quality knives & steel by Schmidt

Moly-Tungsten high-speed steel scientifically heat treated in modern furnaces.

Form ground to any shape.

Priced substantially lower.

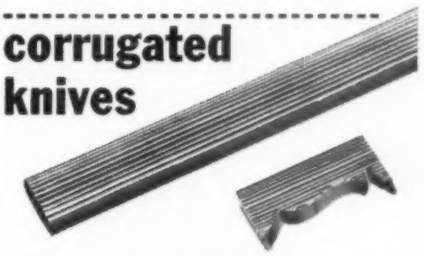


shaper steel

Checked for accuracy to a tolerance of .001" end to end — bar to bar.

Either Plain Bevel or "Lockedge" at no extra cost.

corrugated knives



With corrugations *ground* in—not milled for extra toughness and safety.

slotted knives

Specially hardened to last longer — cut cleaner.

All popular sizes are available from stock for extra fast delivery. Write now for our complete catalog and price list.

Dealer Inquiries Invited

Chas. G. G. Schmidt & Co., Inc.

Originators of "Lockedge" shaper safety collars and steel — Manufacturers of woodworking machine knives and cutter heads since 1926.

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TIPS ON SELECTING MATERIALS HANDLING EQUIPMENT

By Howard M. Palmer
Vice-President & General Sales Manager
Lewis-Shepard Products, Inc.

"Expanding costs" is a term that commands real respect in today's competitive market. And rightfully so, for the cost of doing business has been a big splurge since the end of the World War II.

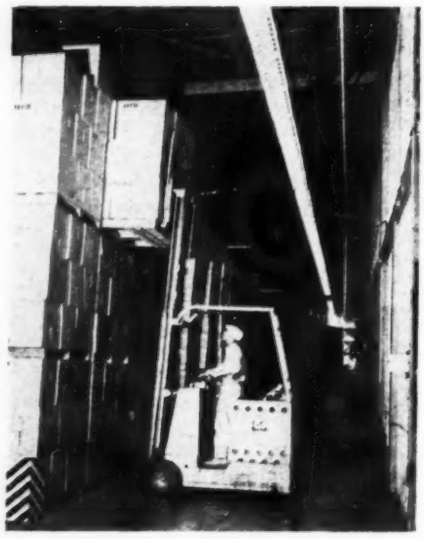
Primarily because of this phenomenon, business and industry has been working overtime to initiate less expensive, more productive methods of operating. In many areas, this drive has been featured by significant success stories. But none more successful than in the field of materials handling.

Materials handling has been a prime target of the cost-cutting movement because it is an operation that adds nothing to the value of a product, only to the cost. In fact, it conservatively represents 25% of the cost of the average product.

It is obvious that materials handling represents a major opportunity to reverse the trend toward rising costs. Before investing in new equipment, however, companies should first ask themselves three questions: (1) Can the investment be justified? (2) What type of equipment is best for my operation? (3) What type of power is most economical, most adaptable?

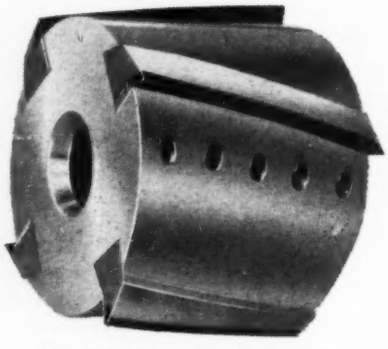
There are methods of answering all three questions. For instance, justifying the investment is usually a case of time, labor and/or space savings. If an electric fork truck reduced the working force by one man, this alone would justify the investment. At current wage scales, the two-year salary of one man probably would exceed the initial investment in the electric work.

Space savings would also be possible since fork trucks are capable of stacking goods right to the ceiling in warehouses. Under man-handling



Goods are high stacked right to the ceiling in this warehouse by a Lewis-Shepard model "E" electric fork truck. Such techniques have enabled firms to expand their storage capacity without expanding the plant.

MARCOLOY
TRU-HELIX CUTTERHEAD WITH *Spiral* CARBIDE KNIVES



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NO TEARING ON CROSS & END GRAIN VENEER—PLASTIC—LAMINATES, HARD & SOFT WOOD.
FOR SHAPERS, JOINTERS, MOULDERS, TENONERS
FROM 2" TO 12" DIAMETERS. 1" TO 8" IN LENGTH.

MARCOLOY CARBIDES
MARCOLOY, INC.
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K-5
JOINTS, Sets and Files in ONE Operation

Sharpens 60 teeth a minute with absolute uniformity. A very special feature is that saw is firmly locked in place by solid steel cam while being filed and set. K-5 gives you better, faster cutting band saws—also saves you the cost of a second operation.

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WARDWELL
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Maker of Largest Line of Saw and Tool Sharpening Machines

methods, this is obviously a physical impossibility.

To cite an example, Lewis-Shepard Model "E" electric fork trucks are able to stack goods to heights of 15' and more. The average person cannot reach heights half this distance. Thus, it can be seen that a truck can frequently increase a warehouse's storage potential by 50%. Sometimes this has precluded a costly new construction program for companies.

A good standard is that new materials handling equipment repay its investment within two years. If the equipment does not meet this standard, it should be considered economically infeasible.

Next consideration is the type of equipment suited to the operation. Basically, this is a question of hand vs. power equipment. Some observers are unduly power-equipment conscious . . . to the detriment of hand. But hand is preferable in certain situations. One situation is where floor capacities are low. Another is when operating space is extremely limited and short hauls are the rule. And, of course, hand equipment is lower priced than power.

For situations where goods are to be transported fairly lengthy distances, power trucks are the choice. Goods can be stacked to greater heights with the power, and, naturally, power does its jobs faster.

Therefore, the choice of hand or power is dependent on the operating conditions. It could be, though, that a combination of both hand and power would work to best advantage. In such a case, the hand equipment would be performing so-called "in-between" jobs.

Actually, there is still another facet of this question. It concerns rider-type trucks as opposed to "walkie" units. "Walkie" trucks, which are battery powered vehicles operated from a control handle while walking along with them, are for short hauls and use in narrow aisles. The rider-type is best suited for long hauls and operating on ramps. Like the "walkies," they are capable of high stacking goods, but generally require more room to maneuver.

In any event, only a manufacturer offering a full line of both hand and power trucks can impartially evaluate the need. And the manufacturer should be able to offer equipment especially "tailored" to the operation.

After the first and second questions have been answered, the potential buyer must select the source of power he desires for his truck. In situations where the vehicle is to be used indoors primarily, an electrically-powered truck is usually automatically selected. Obviously, any vehicle producing noxious fumes and bothersome odors could contaminate the air. The result would be headaches, nausea and similar ailments.

Gasoline and LP-gas trucks still present disadvantages. Among the most serious is the constant fire hazard due to combustible fuels. This is not the case with electric trucks, which are powered by a storage battery. As still another benefit, electric trucks can be "refueled" right in the building at a convenient battery recharging station.

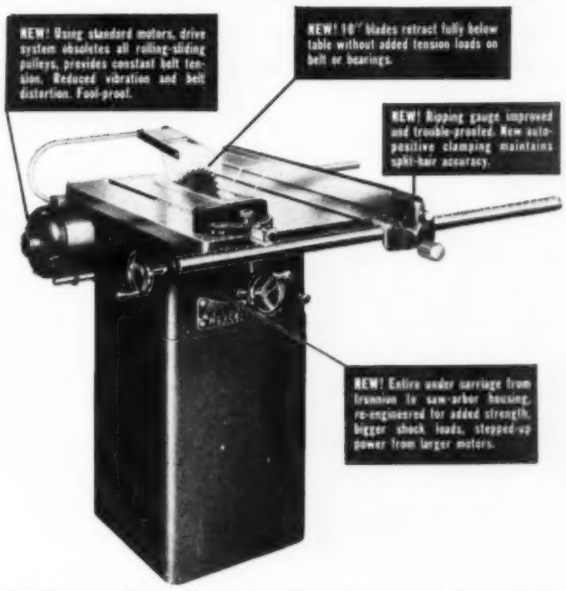
The initial investment in electric trucks is somewhat higher. But since the electrics have a longer life span and cost substantially less to maintain and operate, they are in reality figured to be a better investment. The life of an electric is calculated by experts to be three times that of gas vehicles. As for maintenance costs, they are generally about one-third of gas trucks. On this point, it is only logical that the electrics should have such a wide advantage, since they have fewer working parts where a breakdown could occur.

Like any other equipment, though, all facets of the problem should be considered prior to investing in materials handling products. Some manufacturers

Low floor capacity in this building necessitates the use of this Lewis-Shepard hand lift truck. By pumping a foot pedal, the operator can raise his load hydraulically to heights of 4".

The More You Know About Saws, The More You'll Appreciate the

BOICE-CRANE CHALLENGER 10" TILT-ARBOR SAW


NEW! Using standard motors, drive system obsoletes all rolling-sliding pulleys, provides constant belt tension. Reduced vibration and belt distortion. Fool-proof.
NEW! 10" blades retract fully below table without added tension loads on belt or bearings.
NEW! Ripping gauge improved and trouble-proofed. New auto-positive clamping maintains split-hair accuracy.
NEW! Entire under carriage from trunnion to saw-arbor housing, re-engineered for added strength, bigger shock loads, stepped-up power from larger motors.

A high quality, but really low-priced, precision circular saw.

- Full-floating, frictionless, rolling-pulley drive gets all the power to the blade, and reduces belt wear vibration to a minimum.
- More capacity to the gauge.
- Brawn aplenty for heavy overload. Oversize bearings, arbor, trunnions and undercarriage.

Write for catalog and prices.

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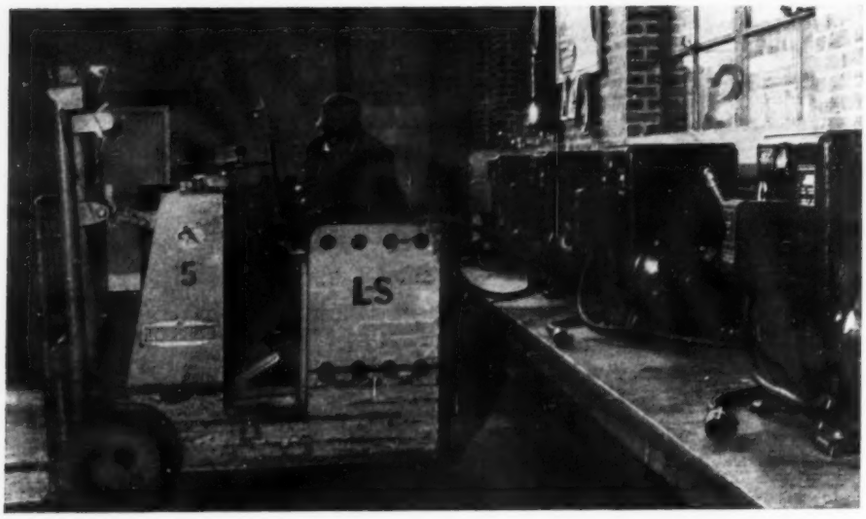


Recharging the batteries of this Lewis-Shepard electric fork lift truck is a simple task. Batteries are normally recharged after each 8-hour shift, and are then ready for immediate operation the next morning.

offer a free pre-installation survey as a standard part of their service.

After the survey has been completed by a materials handling engineer, he analyzes the results and makes definite recommendations for new procedures and equipment.

When the new equipment arrives at the installation site, personnel that will operate the equipment should undergo a brief training course. Again, it is the materials handling engineer that presents the course.

Only through these courses will the company obtain the optimum performance from its new equipment. While materials handling equipment normally significantly decreases the accident rate, the training plays a major role in making this possible.

In any event, it is the professional approach to a materials handling problem that can reap big cash savings for any company, large or small. The application of the proper equipment is, in fact, an important method of reversing the current inflationary trend—and putting profits back in any business picture.

Commercial Financing Studies

Within the next decade, many more furniture and wood-working companies will be using commercial financing to expand their production and sales, according to Theodore H. Silbert, in a study for the Foundation For Management Research.

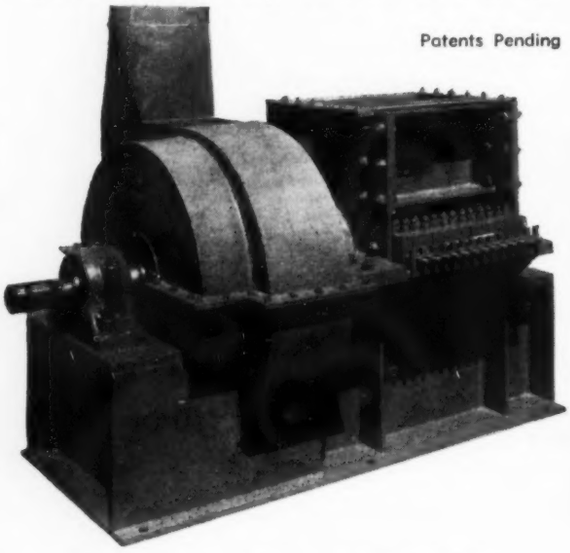
This study is aimed at describing accounts receivable financing, factoring, financing of installment sales of finished goods by manufacturers, and costs and mechanics of financing.

Copies available from the Foundation for Management Research, Inc., 121 W. Adams Street, Chicago 3, Illinois.

Use postpaid card. Circle No. 19

Announcing New Model

Patents Pending



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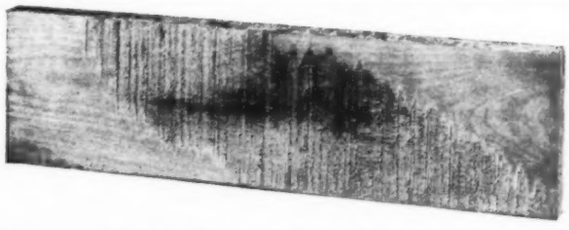


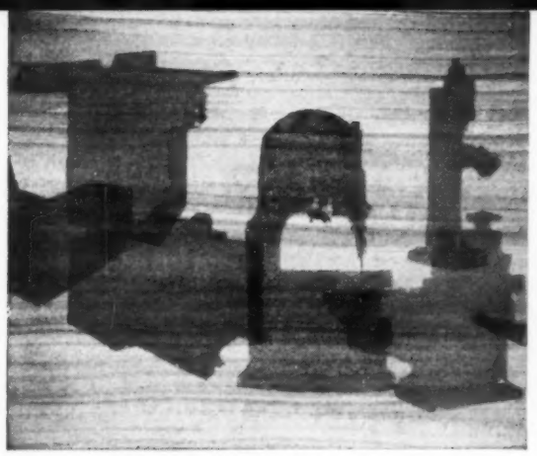
Piece of badly twisted hard maple one time through a Billstrom Feeder.

Note the cut is equally divided on the low corners exactly like hand feeding.

Handles anything any power feeder will handle. Long or short stock.

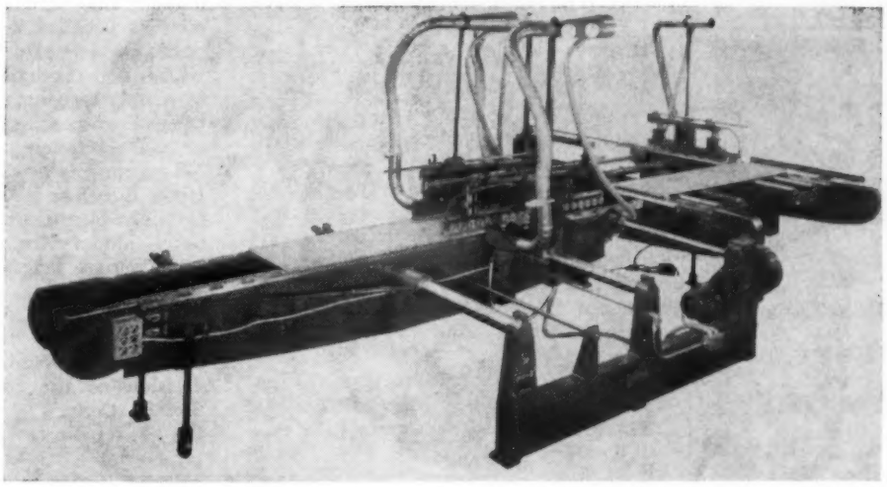
NELS J. BILLSTROM, INC.

ROCKFORD, ILL.



equipment and supplies

New Unit for Sizing, Transferring and Cross-Trimming Panels



Two new No. 140 series Jenkins double end machines with power driven transfer table make a compact unit which handles stock from ⅛"—4" thick, 6"—96" between saws, and up to 120" long. The first machine trims long sides and the second cross-trims. Operation is fully automatic and the flow of stock through the unit is continuous rather than intermittent.

This unit features automatically timed feeding mechanism on the first machine. Panels and doors are placed on a timed feeder and are automatically lowered to continuously running feed chains. Automatic timing means transfer table and the second machine is always filled to capacity. This prevents jamming of stock. A miss or delay in feeding does not alter cycling of the unit. Both machines have infinitely variable rates of feed.

The cutting tool spindles tilt 90° up or down, and permit use of saws, jointer, or cope-type cutters. Spindles have full vertical and horizontal adjustment. Additional saw arbors and dado assembly for multiple grooving can be installed.

The entire transfer unit is complete with electric controls, scales for setup, flexible dust tubes, overhead manifolds, dust hoods, guards and other safety features. The machines are custom-built to size desired.

Manufacturer: Jenkins Woodworking Machinery, Div. of Kohler-Joa Corp., Sheboygan Falls, Wis.

Use postpaid card. Circle No. 20

"Non-Com" Treated Wood Rated Non-combustible

"Non-Com" pressure-treated wood—a newly developed product of Koppers Company, Inc.—has been classified as basically non-combustible in certain fire insurance rating schedules, and approved for many industrial construction applications by Factory Mutual Engineering Division, and the Factory Insurance Association. In addition, Underwriters' Laboratories have tested the product and approved it for labeling at the lowest flame spread classification assigned to treated wood.

Recognition of "Non-Com" fire resistant wood by these organizations in effect materially reduces the insurance rates obtainable in construction applications utilizing this treated wood as a structural material. The new fire retardant chemical used in treating "Non-Com" is a development of Koppers Wood Preserving Division, which has for years been a leader in the pressure impregnation of wood and wood products.

After extensive testing, Underwriters' Laboratories rated "Non-Com" fire resistant wood as having a flame spread of 10 to 15 with no evidence of significant progressive combustion in a 30 minutes test duration.

Koppers labeled "Non-Com" fire resistant wood is the only pressure impregnated wood product now available commercially that meets the rigid specifications for non-combustibility established by the principal testing agencies for insurance classification purposes.

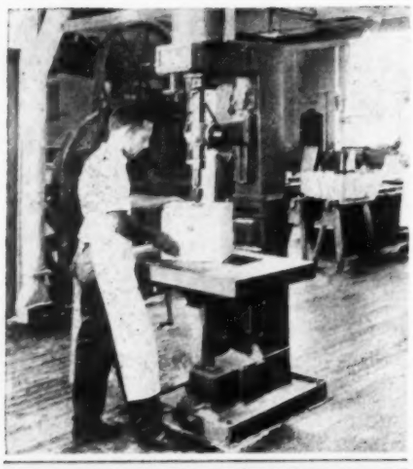
Manufacturer: Koppers Company Inc., Pittsburgh 19, Pa.

Use postpaid card. Circle No. 21

Precision Drilling Machine For Patternmaking

A versatile precision drilling machine expressly designed for the needs of the modern pattern or model shop has been developed by Leland-Gifford Company, well-known manufacturer of sensitive drilling machines. Built to the specifications of their own master patternmakers, it features an extra large, plain surfaced, tilt-top table; deep spindle nose to table capacity; heavy duty spindle and quill; and wide speed range.

The table measures 40" wide by 23" deep, tilts to 45° either side and has a smooth top to facilitate work handling. It is raised or lowered by a convenient hand crank with 29" maximum spindle nose to table distance (larger capacity available). Space between spindle and column is 13" which permits working to the center of pieces up to 26" wide.



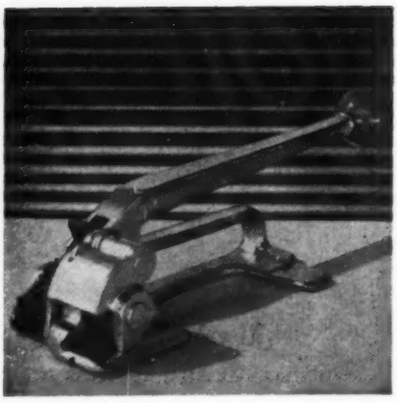
Speed settings are indicated on an illuminated chart.

Other features include a built-in light to illuminate the table and work; foot switch start-stop motor control which leaves the operator's hands free; and counterbalanced sliding head for effortless vertical adjustment.

While this new machine has many unique features that adapt it to the woodworking needs of pattern or modelmaking shops, it is fully capable of handling the metal or plastics drilling operations encountered with increasing frequency in modern shops.

Manufacturer: Leland-Gifford Co., Worcester 1, Mass.

Use postpaid card, Circle No. 22



Stanley Tightener for Steel Strapping

A versatile unlimited take-up steel strapping tool is now being marketed by Stanley Steel Strapping, division of the Stanley Works, New Britain, Conn. Lightweight and sturdy, the new Stanley "O" tightener is used to apply steel strapping to packages of varying sizes, shapes and weights, it may be operated in any position and will strap in any direction—using the right or left hand.

Applying seals to the rear of the tensioning wheel cuts overlap to minimum required for maximum joint security. The tightening action is more positive because there are two holding pawls instead of one on the tensioning wheel, and the tool is removed quickly by simply returning the tightening lever to its down position and sliding the tool from the strapping.

Two models are available, the "OL," (light duty) and "OM" (medium duty) for light and medium duty strapplications. Model Nos. "OL3", "OL4" and "OL5" take strap sizes ⅜", ½" and ⅝" respectively. Model Nos. "OM5" and "OM6" take ⅝" and ¾" respectively.

Manufacturer: Stanley Steel Strapping, division of the Stanley Works, New Britain, Conn.

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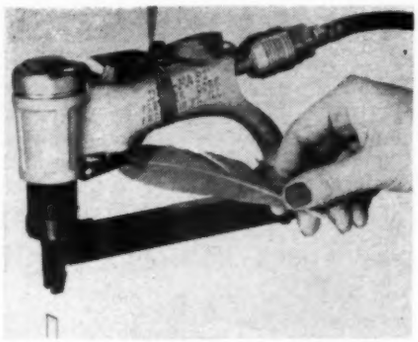
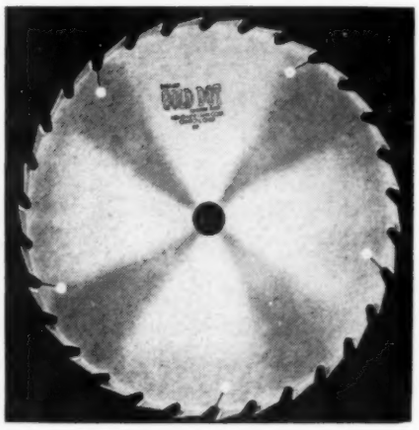


A new easy-trip air tacker is now available from the Fastener Corp., manufacturers of the Duo-Fast staplers, tackers and staples. The major feature of this new model is a feather-touch trigger which requires very little pressure. The tacker will drive staples as fast as it is humanly possible to flick the trigger. The re-styled handle of this new model provides an interior air reservoir, plus handling comfort for the operator.

Manufacturer: Fastener Corp., 3702 River Rd., Franklin Park, Ill.

Use postpaid card. Circle No. 24

New Saw Blades



The Heinemann Saw Corporation has announced the addition of three new circular saw blades to its line. The new "Gold Dot" rip, "Gold Dot" cross-cut, and "Gold Dot" combination blades are all fabricated with the object of minimizing whistle and scream, and eliminating vibration. Manufactured of high nickel content steel, these blades contain built-in vibration dampeners consisting of copper inlays inserted under tremendous pressure of the base of each expansion slot. All blades are hardened and tempered in the latest controlled-type furnaces. Each blade is completely fabricated and pre-tensioned before heat-treating. New carbide tips are made from quality carbide and tungsten alloys and "locked in" for extra durability under all cutting conditions.

Sizes range in diameters from 3"-36" and thickness from .025" to 7/16". Tooth spacing available from ⅜" pitch and up.

Manufacturer: Heinemann Saw Corp., 2025 Navarre Rd., S. W. Canton 6, Ohio.

Use postpaid card. Circle No. 25

Two-Saw Edger

A new two-saw edger featuring preselection of cutting width through remote control has been added to the line of saws produced by the G. M. Diehl Machine Works, Inc. Designated the No. 999 two-saw edger, the new machine

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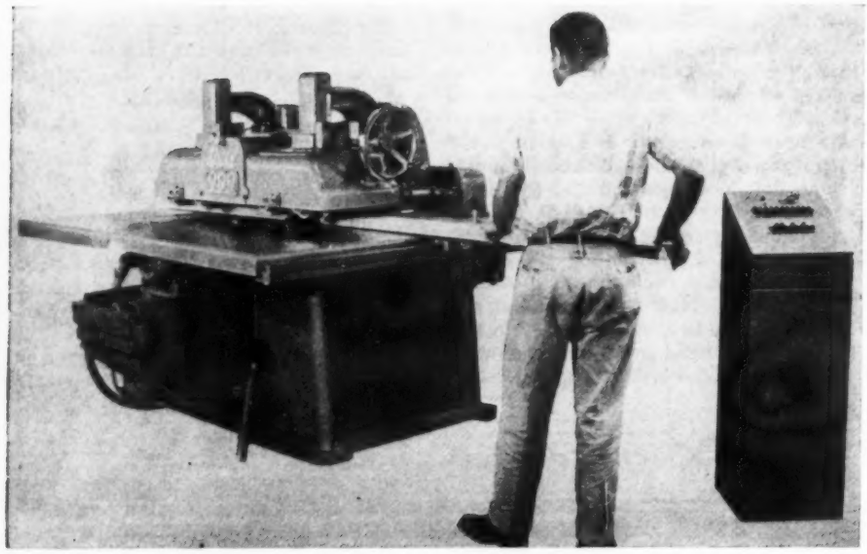


features a fixed inboard arbor and a movable outboard arbor. Positioning of the outboard arbor is accomplished with an air cylinder, actuated from a separate control panel. Positioning is quick and accurate, with stops permitting 88 different cutting widths.

All 88 positions are obtained through 19 pushbuttons on the remote control panel. The pushbuttons are "self- cancelling"—that is, when actuated, each button releases the previous stop and energizes the new stop. The design is such that blade positioning cannot be accomplished until stock has cleared the machine.

Width of cut on the No. 999 is indicated to the operator by red lights on the control panel. The panel also includes an emergency stop button for arbor motors and feed motors.

When a new position is selected by the operator, the arbor motor goes directly to that position without first returning to the fully open position. Repositioning of the arbor takes a maximum of two seconds.

The No. 999's movable arbor can be adjusted for net cut due to variations in kerf.

The Diehl No. 999 two-saw edger can be furnished with canted rolls and guide which permits cutting to the curvature of the stock to obtain maximum yield, or it can be furnished for straight line cutting with a quick adjustable gauge and straight rolls.

Minimum width between blades on the No. 999 is 1⅝" and maximum width is 12⅞". With a 14" saw blade, the machines handles stock up to 2" thick. With a 12" blade, it handles stock to 1" in thickness. Minimum thickness is ¼".

Standard arbor motors are 3-phase, 15 h.p. units, with 10 or 20 h.p. motors available as optional equipment. Available voltages are 200, 440 and 550.

The feed motor drives eight feed rolls and is rated at 3 h.p. It can be operated at four speeds for feeding stock at 87-206 f.p.m.

Manufacturer: The G. M. Diehl Machine Works, Inc., Wabash, Ind.

Use postpaid card. Circle No. 26

Odorless Contact Adhesive

A new contact adhesive—non-flammable, essentially odorless and non-hazardous—has been developed and is now being marketed by Formica Corp., subsidiary of American Cyanamid.

Called "Formica Safe-Bond," it can be brushed, sprayed or rolled on plastic laminates, plywood, particleboards, plaster, plasterboard, hardboard and a wide variety of other materials. Among its other advantages: non-hazardous, non-flammable and essentially odorless; Formica Safe-Bond has a spread rate of 300-320 sq. ft. per gal.; application is easily cleaned; and heat resistance is good.

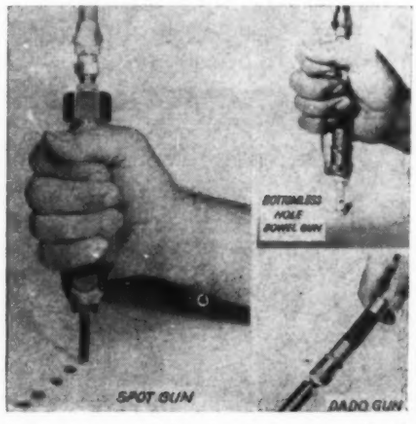
Manufacturer: Formica Corp., 4614 Spring Grove Ave., Cincinnati 32, Ohio.

Use postpaid card. Circle No. 27

New Spot Glue Guns

An entirely new selection of automatic spot glue guns, for accurately positioning a circular film of glue on any flat, hard surface, has been announced by the John P. Fox Co., Inc., manufacturers of a complete line of gluing equipment for industrial use. These new guns, made for spot sizes ¼"-1" in diameter, are available for either manual or mechanical use. Featured are non-clogging design, extreme speed minimum operator fatigue, complete elimination of drippage and glue waste.

The manufacturer also announces two new lines of (1) bottomless hole dowel guns and (2) dado groove guns. Bottom-



less guns available for hole size ¼"-1" in diam., while dado guns are for groove widths from ½"-1". All guns will handle low viscosity, cold glues, including some catalyst type adhesives.

Manufacturer: John P. Fox Co., Inc., 1107 S. Mountain Ave., Monrovia, Calif.

Use postpaid card. Circle No. 28

BAND RESAW BLADES

WHY

are so many users of resaws ordering Burton Steel Head Band Resaw Blades?
They're "Filer Finished!"

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ASK YOUR SUPPLIER

ADJUSTABLE CLAMP CO.
"the clamp folks"
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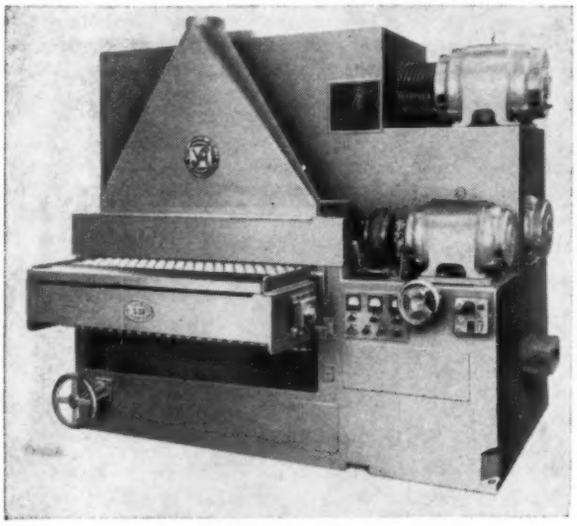
Yates-American Introduces Wide Belt Sander



Wide belt sander which combines both drum and belt sanding operations.

This machine combines drum and belt sanding operations on one base and frame. Separate stroke sanding is held to a minimum and in some cases entirely eliminated through a versatile design which employs either one roughing drum and two belts, two drums and one belt, or three belts.

The drum brings material to size, and belts do finish sanding which normally would require a separate pass. Since the belts need remove only a minimum of material, the machine delivers a superior finish in one operation.

Belts can run either over a conventional serrated roll or over a flexible platen. The belt over the platen provides a finish comparable to conventional stroke sanders. A slotted contact roll for the belt is available with different degree of angles and durameter of rubber to obtain a variation in aggressiveness of belt action and finish. The 103" belt comes in 43" or 55" widths with speeds variable from 3800 to 6000 s.f.p.m.

Belt tracking is automatic with air control to assure good oscillation, and belts can be arranged to operate with or against the feed travel. Abrasive changing time is held to a minimum.

With extra wide platens between drum and belts, little difficulty is experienced in sanding warped material since the platens keep the stock firmly against the bed. The endless bed arrangement has been engineered to allow for high feed rates—from 30-90 f.p.m. The feed drive is enclosed in the base of the machine.

Bedways are of special design with positive lubrication at several points. Chain links are of new design—also pressure lubricated; reduction gears operate in a bath of oil. The panel is separate, and all controls are at operator's position. A jog button is provided for preliminary tracking of the belt. **Manufacturer: Yates-American Machine Co., Beloit, Wis.**

Use postpaid card. Circle No. 29

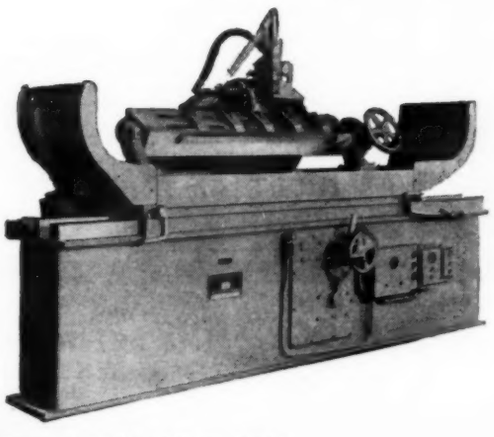
Automatic Boring Machine For TV Cabinet

A new, completely automatic boring machine has been engineered for the General Electric Company by Indiana Foundry, Machine & Supply, Inc., Brazil, Indiana. The machine, designed for boring television cabinet panels, is in operation at General Electric's Wabash, Indiana, plant.

The special borer is self-loaded from

ROGERS

KNIFE GRINDERS



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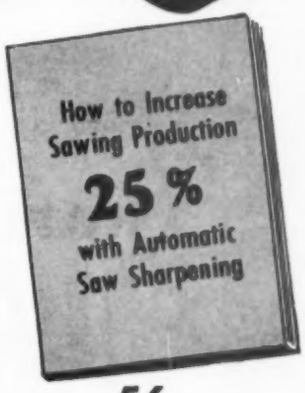

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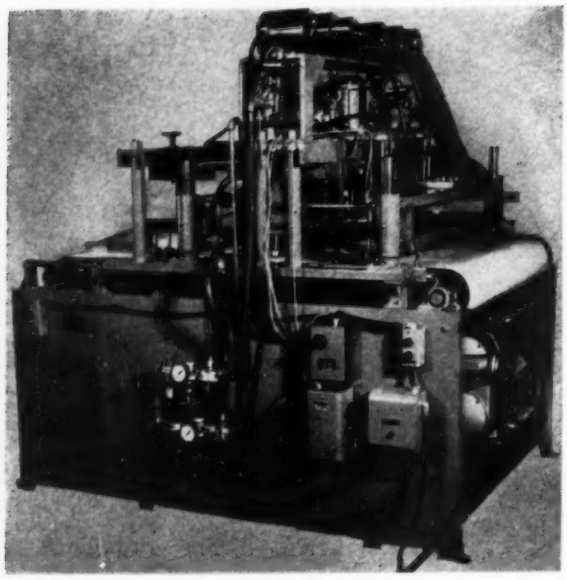


New boring machine offered for TV cabinet manufacture.

a double-end tenoner which precedes it in the assembly line. The conveyor belt which carries the panel to the work area, and the boring units themselves are electronically actuated, being controlled by a photo-electric cell working through a transistorized amplifier to trigger the operation.

A variable speed drive on the conveyor permits the boring machine to be synchronized exactly with the output of the tenoner. An electrical interlock combined with an automatic cutoff renders the machine completely inoperative in case of a power failure.

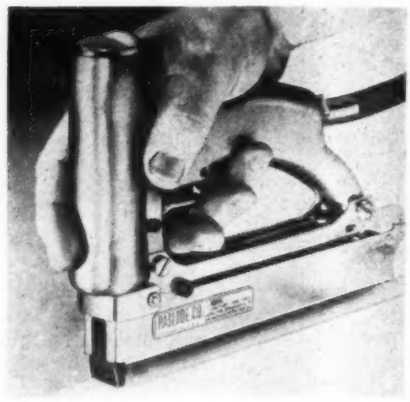
In addition to special equipment of the type designed for General Electric, Indiana Foundry, Machine & Supply, Inc., offers a line of standard boring machines, sanders and saws.

Manufacturer: Indiana Foundry, Machine & Supply, Inc., Brazil, Indiana.

Use postpaid card. Circle No. 30

Air-Power Stapler

Two major stapling tool improvements—air return and righ-speed piston—are combined in the new Paslode Model AR air-power staplers. Jet driven air return delivers positive high speed action and extends tool life; eliminates parts most subject to failure in any stapler, and helps stop costly production line delays. A high speed nylon piston drives staples without recoil.



AR staplers take Paslode wide and narrow crown staples in leg lengths from 3/16" to ¾".

Manufacturer: Paslode Company, 5860 Northwest Highway, Chicago 31, Illinois.

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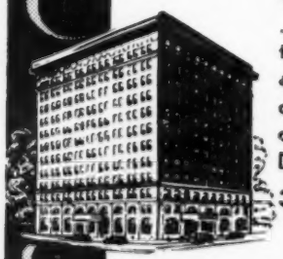
Tops in Everything

CONVENIENT



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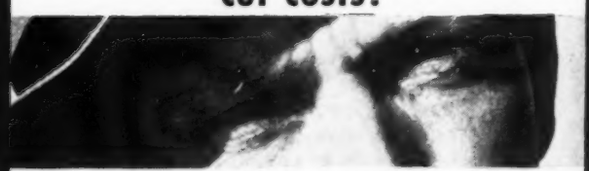
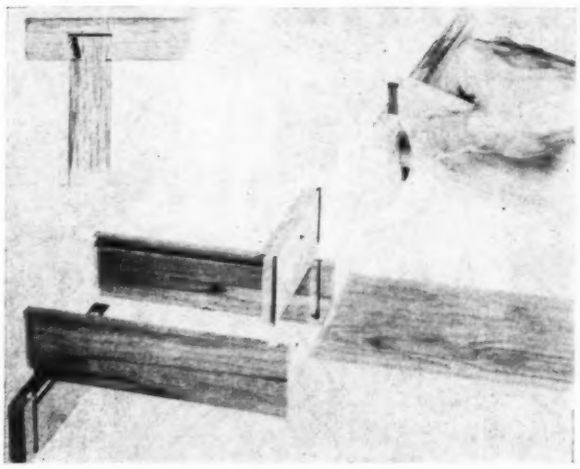


SEE HOW IT'S DONE. Send today for Case History 901. Corley Mfg. Co., Dpt HW-128 Clifton Hills, Chattanooga, Tenn.

CORLEY SAWMILL MACHINERY

Cost Cutting is Our Business

KD Wood Drawer System



This KD wood drawer system is known as the D-strip system and was developed to fill the demand for a complete KD casegoods package where both the case and drawers can be fabricated and shipped in the flat. A rubber compression strip is attached to the male member of a sliding dovetail. This rubber compression member acts as a built-in shock absorber at the same time it provides for a tight friction fit. The rubber is designed to compress or expand to allow for the variations in wood dimensions due to humidity changes or woodworking tolerances.

The manufacturer, Dynacon Corp., says that the D-strip makes possible a DK drawer which has a minimum number of parts, is easy to assemble and provides for a strong, rigid, knock-down assembly.

Manufacturer: Dynacon Corp., 5475 Bow Mar Drive, Littleton, Colo.

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New Tapeless Splicer Glue and General Purpose Adhesive

Two new adhesive resins which have improvements over earlier formulations are now available from American Cyanamid Company. Both resins offer improved performance and special benefits.

Melurac (R) 260, Cyanamid's improved tapeless splicer glue, designed to provide faster curing in veneer bonding operations, replaces Melurac 259.

The melamine-fortified urea resin, with catalyst incorporated, can be used in exactly the same manner as 259 except that, because of faster curing, lower temperatures are recommended for splicer bars. This minimizes the possibilities of scorching and discoloring light-colored woods. No additive is required for use other than water.

Melurac 260 contains a small amount of nut shell flour which imparts a faint tan color to the glue line, making it almost invisible with either light or dark wood veneers.

A new general purpose adhesive resin—Melurac (R 305—has also been developed by Cyanamid. A filled melamine-urea adhesive in dry powder form, it is used in producing exterior and marine grade panels, doors, skis, boats and hardwood block flooring.

A more water proof variety of Melurac 300, it allows greater assembly time flexibility and will produce better adhesive bonds with hard-to-glue woods, such as heart gum, at no increase in price. It has the further advantage of consistent conformance to Commercial Standard CS-35-36, Type I requirements for waterproof adhesive bonds, accepted by government and industry for all types of woods and assemblies.

The same performance can be expected as for Melurac 300 on glue spreader equipment, and identical hot pressing schedules can be used.

Manufacturer: American Cyanamid Co., Plastics and Resins Div., 30 Rockefeller Plaza, New York 20, New York

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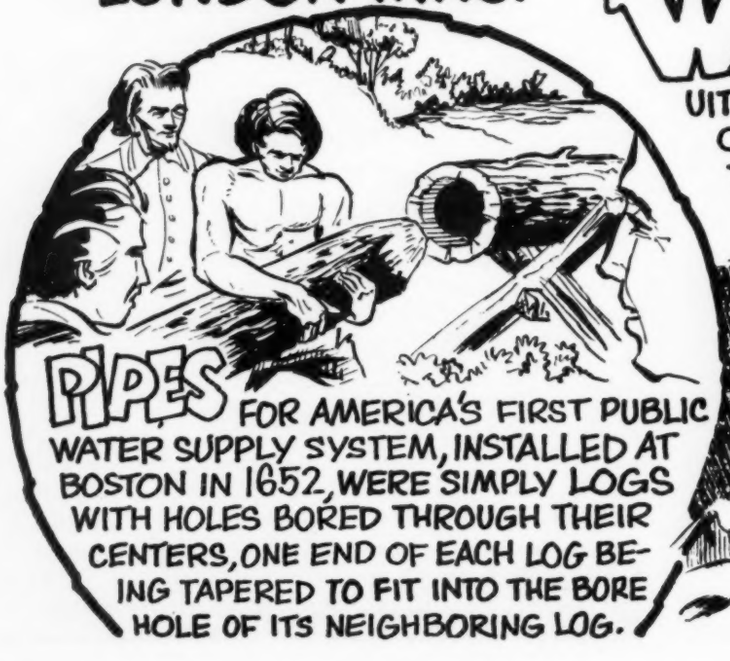

PIPES FOR AMERICA'S FIRST PUBLIC WATER SUPPLY SYSTEM, INSTALLED AT BOSTON IN 1652, WERE SIMPLY LOGS WITH HOLES BORED THROUGH THEIR CENTERS, ONE END OF EACH LOG BEING TAPERED TO FIT INTO THE BORE HOLE OF ITS NEIGHBORING LOG.

While THE BUILDERS OF ANTIQUITY WERE COVERING ROOFS WITH CORK BARK, THEIR WIVES, DAUGHTERS OR SWEETHEARTS WERE USING IT AS LINING MATERIAL FOR THEIR WINTER FOOTGEAR!

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it's a MOAK No. 7 SHAPER

SPEEDS UP TO 12,000 R.P.M.
Standard speed is 8350 R.P.M. But with the ¾" spindle, speeds up to 12000 R.P.M. can be furnished at no extra cost.

SIMPLE, FAST, SURE ADJUSTMENT
The yoke can be raised or lowered by a quick acting screw within easy reach of the operator, and can be held at any point by a handy locking device.

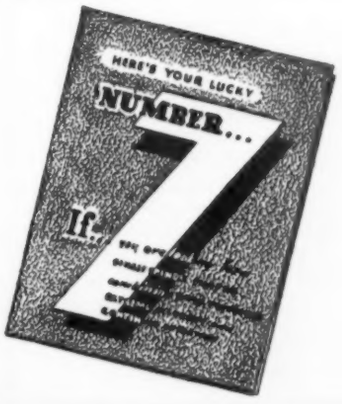
POSITIVE LUBRICATION MINIMIZES HEATING
A special Moak oiling construction assures constant lubrication and at the same time prevents over-oiling, thus keeping heating at a minimum at all times.

TABLE GROUND AS SMOOTH AS GLASS
So smooth a man can feed material across it almost effortlessly. Furthermore, the table is at a perfect right angle to the spindle and is true and level over its whole surface.

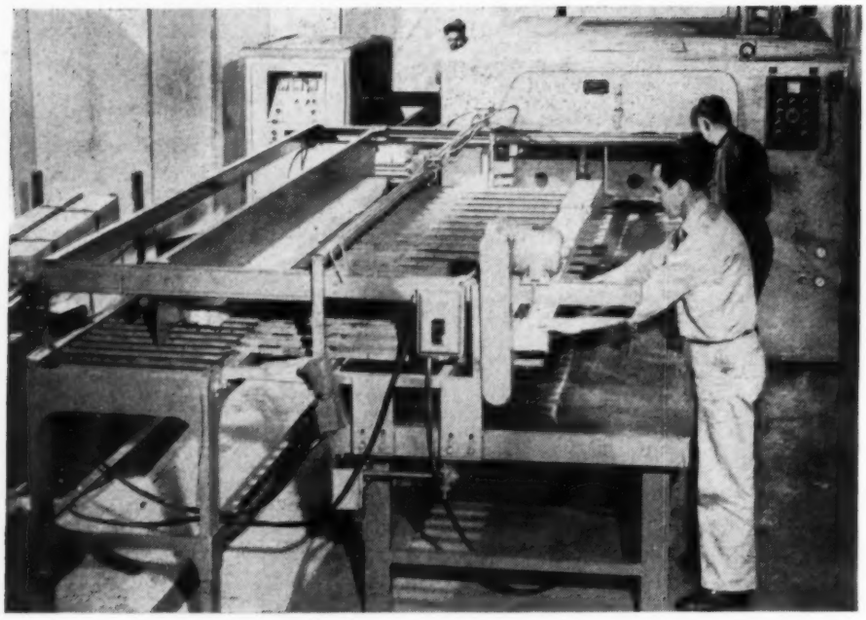
BASE PROVIDES PLENTY OF FOOT ROOM
Moak has designed the base to give the operator lots of convenient foot space close to his work. This makes for operator comfort and helps speed up work.

COMPLETE PROTECTION FOR THE OPERATOR
Entire pulley and belt are covered with a cast iron guard that prevents chips from entering the motor or interfering with the belt. A guard for the knives is available as an extra.

You don't buy a shaper every day. When you do, buy the best. For complete information on the Moak Single Spindle Shaper write for our illustrated bulletin.



Electrogluer In Use at Wurlitzer



A high frequency gluing machine in use at Wurlitzer's DeKalb, Illinois plant. This machine, manufactured by the Union Tool Corporation, Warsaw, Indiana, handles stock of ½" to 4" thickness and features electric eye control.

In a move toward streamlining the edge bonding of laminated stock, Wurlitzer's DeKalb, Illinois, plant has installed a Union high-frequency electrogluer for use in their production line.

Union electrogluer handles stock of ½"-4" in thickness in both hardwood and softwood. It features electric eye control, convenient control panel, and handy press adjustments. The unit has an especially designed air-hydraulic pressure system which can give 10-400 lbs. p.s.i. of pressure on all material required.

Glue line requirements of any thickness are automatically set by an automatic timer and power control to the generator. Pushover arms feed the material to a motorized layup operator-controlled conveyor. The offbearing operator is also the feeder for the glue spreader. The infeeder, or layup operator, controls the press and layup of stock.

The generator is of the dielectric type, 20 kilowatts in capacity, and is water cooled for maximum life of tube components. Press and generator are fully shielded to meet F.C.C. requirements.

Manufacturer: The Union Tool Corp., Warsaw, Indiana.

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Manufacturer: Calcu-Tax Corp., 49 W. 37th St., New York 18, New York.

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Borers, Greenlee No. 369, 5 Ft. Vert. 4 Spdle dmd
Borers, Andrews Sgl. Spdle. dmd
Borers, Andrews 60"—8 Spdle. Vert.
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Borers, Greenlee 5 Spindle Horizontal MD
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Clamps, McKnight Chair
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Glue Spreaders, Francis 12" Sgl. Roll, V-drive
Grinder: Buffalo 76" knife dmd
Jointers, American 12" BB, DMD
Jointers, New Moak 12", bb, dmd
Jointers, 12"—8" and 16" bb, v-drive
Whitney, back knife, BB, v-drive
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Mortiser, New Britain No. 7 bd. & motor
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Hermance No. 300-GS gang self-feed rip

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Greenlee No. 545 D & E

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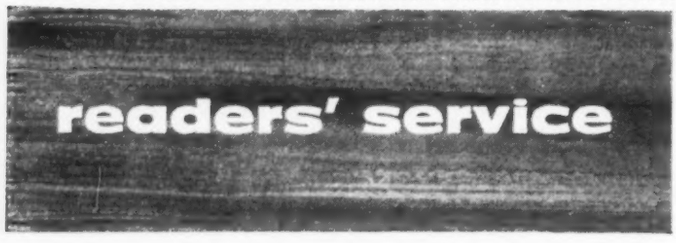

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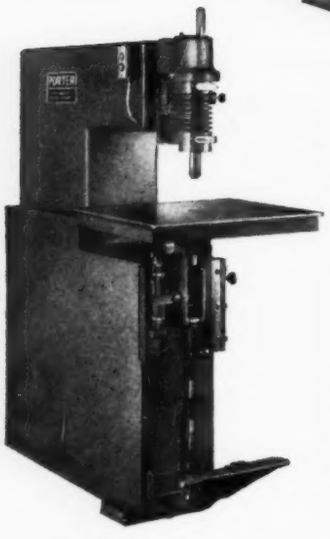
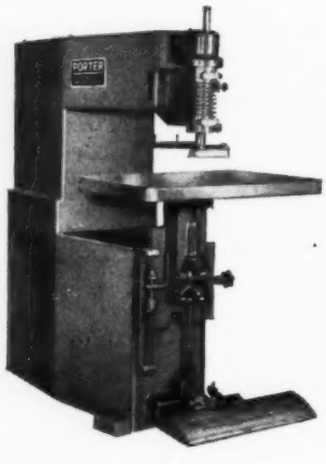


MODEL 900 ROUTER



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POSTAGE-FREE ACTION CARDS

PRODUCT INFORMATION

A quick, FREE way to obtain information about the equipment and supplies you need to buy.

- Abrasive
- Coated
- Adhesives (Specify Kind)
- Air Conditioning Systems
- Arbors, Motor
- Arbors, Saw
- Bags, Paper
- Band Saw Accessories
- Band Saw Tires & Wheels
- Barkers
- Bits (Specify Kind)
- Blankets, paper
- Bleachers
- Blower & Fan Systems
- Bolt Drivers
- Bolts, spray
- Bores (Specify Kind)
- Boring Tools
- Brazing Equipment
- Brushes
- Casters
- Clamp Carriers
- Clamping Fixtures
- Clamps (Specify Type)
- Clamps & Jigs
- Cleaners, booth
- Clippers, veneer
- Compressors, air
- Conveyors
- Cutoff Tools
- Cutter Blanks
- Cutters, Heads
- (Specify Kind)
- Cylinders, air
- Cylinders, hydraulic
- Dado Heads
- Dimension Stock
- Dowels
- Drawer Equipment
- Driers, furniture
- Driers, veneer
- Drill Attachments
- Drill Heads
- Drills, electric
- Drills, multiple spindle
- Dry Kilns
- Dry Kiln Control Devices
- Dust Control Equip.
- Edge Banding Equip.
- Edgers, lumber
- Enamel
- End Matchers
- Fasteners: corrugated
- joint
- special
- Fastening, insert
- Feeding Drives
- Equip.
- Filling Room Equip.
- Finishes
- Finishes
- Flexible Shaft Equip.
- Furniture & Chair Parts
- Gauges, saw
- Generators
- Glue, electronic
- Glue, veneer tapeless edge
- Grinders
- Grooves
- Guards, machine
- Guide Lights
- Guides, saw
- Gum, glue
- Gum, spray
- Hardboard
- Hardware
- Heaters, glue
- Heaters, paint
- High Frequency Electronic Bonding Equip.
- Hogs
- Humidifying Equip.
- Jointers
- Jointers, veneer
- Knives (Specify Kind)
- Lathes
- Lumber, hardwood
- Lumber, imported
- Lumber, softwood
- Machines, assembly
- Machines, banding
- Machines, barrel
- Machines, basket & hamper
- Machines, bed, post
- Machines, bending
- Machines, boring
- Machines, box & crate
- Machines, box printing
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- Machines, chucking
- Machines, clamping
- Machines, coating
- Machines, copy
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- Plywood, metal faced
- Plywood, molded
- Plywood, plastic faced
- Plywood Novelties
- Polishers
- Portable electric Tools
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- Presses, chipboard
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- Presses, laminating
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- Table Equipment
- Taskers
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- Tenoners
- Trucks, dry kiln
- Trucks, factory
- Veneer
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December, 1958

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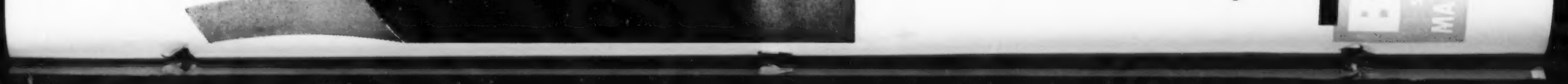

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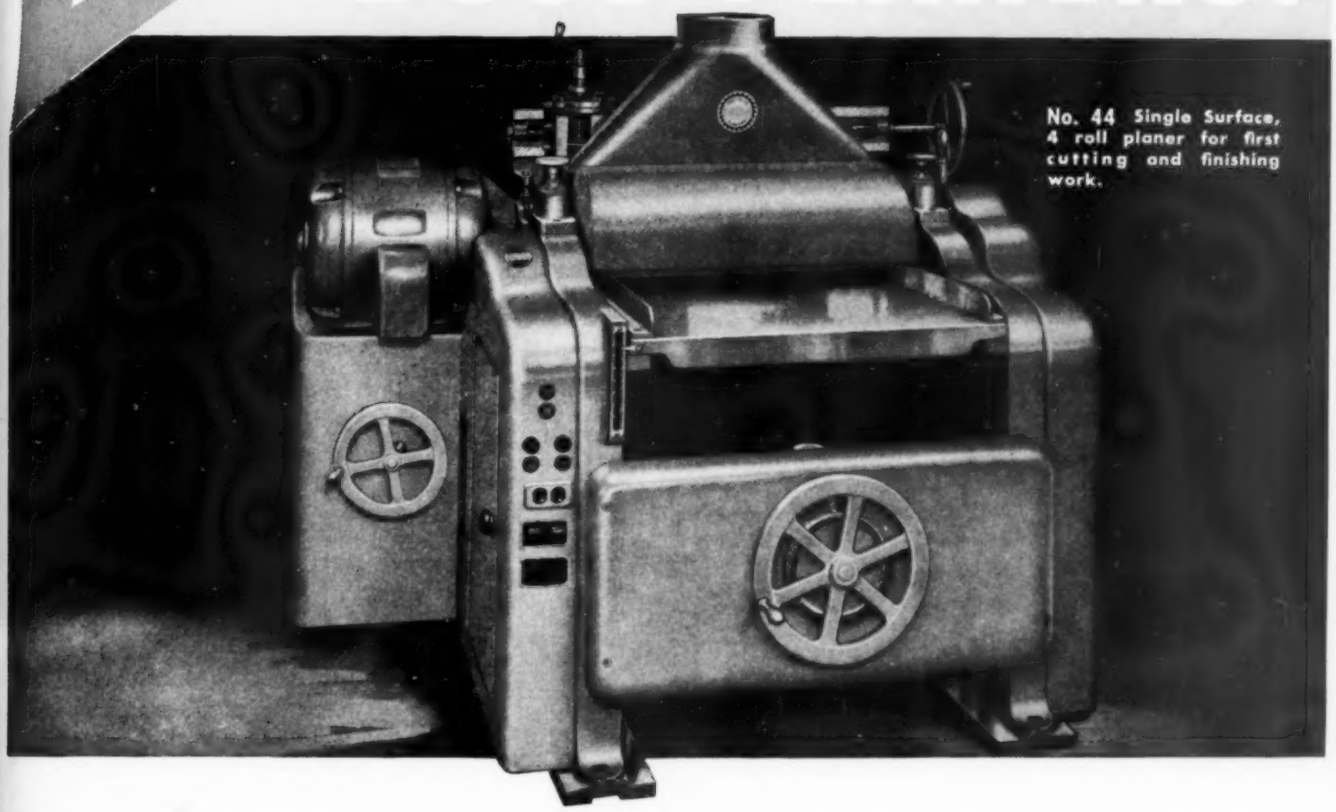

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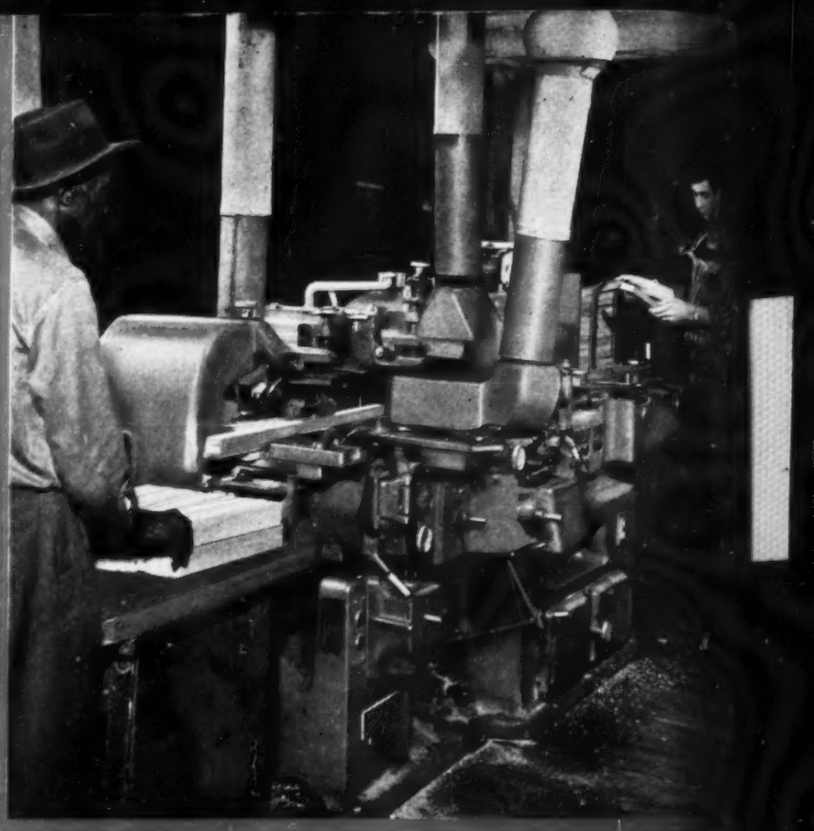

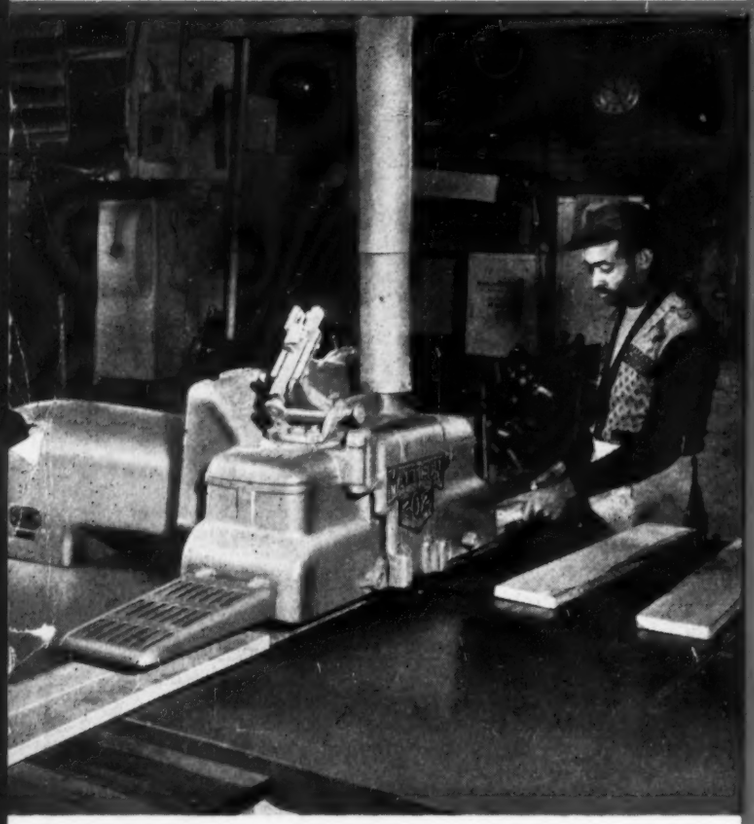

People like Mattison woodworking machines for many reasons—quality work, reliable operation, and high rate of production—all factors that affect profits!

Myrtle Desk Company says: "We have six Mattison 202 ripsaws cutting various types of lumber from soft woods to very hard woods, and have had no trouble at all in cutting straight glue joints on such material as hard white maple and Louisiana pecan lumber. They operate at high speeds and do very fine work. We are extremely well pleased with them.

"We are now operating two Mattison No. 276 moulders, primarily with carbide knives at very high speeds. We are cutting maple and pecan, along with regular furniture woods of walnut and oak. These machines have been running for several years and have given us excellent service.

"We are pleased to recommend these two machines to prospective users."

If you want profitable production at today's reduced volume—plant efficiency paced by precision machines designed to produce top quality at highest speeds—see the Mattison ripsaws and moulders work. Your Mattison dealer can arrange a demonstration at the factory or in a "Mattison-equipped" plant near you.

MATTISON

WOODWORKING MACHINERY

MATTISON MACHINE WORKS ROCKFORD ILL. U.S.A.

"Built better . . . to produce better quality"

Mattison Machine Works
545 Blackhawk Park Ave.
Rockford, Illinois

Gentlemen: Please send literature describing your Model 202 ripsaws ☐; No. 276 electric moulders ☐.

Name_____

Firm_____

Address_____

City_____ Zone_____ State_____